

THE PRESIDENT'S PAGE

An Appeal to Legislative Reason:

Highways are not government subsidized; users paid more than the \$13,000,000,000 bill since 1931 in taxes.

Railroads pay a 1.4 per cent tax on a valuation of \$25,000,000,000.

Highway transportation pays a 4.5 per cent tax on a valuation of \$22,000,000,000, or 3.15 times more.

Excessive taxation is beginning to affect the yield from motor vehicle revenues.

50,000 communities in the United States have no rail facilities and are wholly dependent on highway transport.

COMMERCIAL CAR JOURNAL



By

THOS. P. HENRY

PRESIDENT

American Automobile Association

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for one dollar in Federal Aid. It can, therefore, be fairly contended that the motorists as a class are now subsidizing the Federal government and caring for the great road interest of the latter in our national highways.

The railroads claim a valuation of \$25,000,000,000. On this valuation they paid \$354,000,000 in taxes of all kinds in 1930. This was a tax of 1.4 per cent per annum of the valuation. In the same year, motor vehicle property had a valuation of \$5,500,000,000. On this, the motor vehicle owners paid \$1,000,000,000 in special taxes, that is, gasoline taxes, registration fees, license fees, et cetera. This amounted to 18 per cent of the valuation or an annual tax 13 times as heavy as that paid by the railroads.

It will be objected, of course, that the motor vehicle tax is partly a privilege tax for the use of rights-of-way owned by the states, while the railroads own the capital in their own rights-of-way. Let us, for the moment, concede this—although the highway rights-of-way were paid for in large part by the users—and interpret the motor tax in terms of the total investment in highway transportation, namely, highways, rolling stock, garages and terminals. This is estimated at \$22,000,000,000. On the basis of this estimate, motor vehicle owners are paying 4.5 per cent on the valuation of highway transport, or 3.15 times the tax paid by the railroads.

While the railroads are seeking to create the impression that highway users are not paying their way, the fact of the matter is that there is nothing in the history of American taxation that compares even remotely with the pyramiding of taxes on the motor vehicles. At the present rate of motor taxation, Federal, state and local, the average motor vehicle is paying 175 per cent of its average value in taxes during its life period of seven years. This tax is already beginning to affect not only the use

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In a statement issued July 20, 1932, R. H. Aishton, Chairman of the Executive Committee of the American Association of Railway Executives, asserted that the Federal and state governments had since 1921 subsidized motor vehicle users to the extent of more than \$13,000,000,000. This statement is highly misleading, since it leaves the impression that these funds were provided from general taxes. Now, what are the facts?

In the period 1921-1931, motor vehicle owners paid \$7,600,000,000 in special taxes to state and local governments. These taxes were simply motor tolls specially earmarked for highway maintenance and construction. Add to this \$1,000,000,000 in road bonds issued by the states as a definite charge on the highway users, since they are to be retired from motor vehicle revenues, and it will be seen that motor owners directly shouldered \$9,000,000,000 out of the \$12,000,000,000 road expenditures by the states and counties in that period. The fact of the matter is that the highway users have provided the capital for a permanent investment of billions of dollars for state and local highways.

Now, let us look at the so-called Federal Aid subsidy. At the moment, Federal Aid is on a basis of \$125,000,000 a year, but special motor taxes are on a basis of \$258,000,000 a year. Thus, the highway users are paying the United States Government at the rate of two dollars in Federal taxes

THE LEGISLATIVE WOLF IS AN OBSTACLE TO TRUCK PROGRESS



WHAT is legislation and the threat of additional legislation costing truck manufacturers? What is it costing the dealer and servicing agencies of the transport industry in lost business?

Truck manufacturers wonder why equipment that must be worn out long since is not being replaced. They wonder why their dealers are not getting the sales. They wonder why their own branches can't seem to deal in anything but flocks of "repossessions."

The answer is simple and will be found in the present apparent inability of the industry to shake itself of the spectre of confiscated investments and businesses and the lengthening shadows that cloud the future,

because of the constant threat of adverse legislation in almost every state of the Union.

Just this week in talking to one of the leading West Coast truck distributors, one of the outstanding successes in the business, the full significance of the present legislative battle between highway and rail transport disclosed itself in a new light. He said: "We can not longer sell a truck on the basis of its apparent earning capacity."

Truck salesmen have been schooled for years in job analysis and fitting equipment to the customer's requirements on the basis of the earning capacity of the equipment. This has always been the logical approach. It

And to Beat It Off Cooperation of Every Manufacturer and Employee in Truck and Allied Fields is Necessary

By RALPH J. STAELI

Secretary, Allied Truck Owners, Inc.,
of Oregon

has justified more sales than any other approach and most logically.

With that gone as a sales foundation how far is the truck market curbed? What is the prospect for dealer and manufacturer when the basic justification for truck investment can no longer stand as the underlying motive for the purchase and the sale of a truck?

Yet, this is actually happening and will continue to happen until the industry in all its branches from manufacture to operation makes up its mind that the uncertainty of the future regarding weights, lengths, trailers, hours of drivers, permits and taxes and the host of other ideas that fill the papers are quieted or disposed of or until the man on the road who faces the gun of competitive legislation knows that back of him is an allied industry.

If this condition which is stifling markets were true of but a limited part of the truck field, it would not be serious. It is easy to assume that only this or that limited group is affected. The fact is that all truck usage is under the gun and that the private owner is as much affected in his decisions as is the for-hire carrier. For proof you have only to scan the following list of items which are the subjects of legislative discussions in practically every state in the Union:

Restriction of trailers; weight restrictions; length restrictions; narrower widths; braking systems; hours of employment for drivers; permits and franchise requirements; operating restrictions; limitations as to classes of service; open and closed roads to certain kinds of traffic; higher license taxes; mileage or gross revenue tax changes; commodity restrictions; railroad competition on the highways.

And yet, one manufacturer wrote me
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FARMERS SEE TRUCK BURDENS AS SHACKLE ON AGRICULTURE

Will Oppose All Legislation That Would Deprive Them of Transportation Economies Made Possible by the Truck

By O. M. KILE

Agricultural Economist, Washington, D. C.

THE farmer is entitled to the best and most efficient, as well as the cheapest, transportation that modern invention and development can bring to him," said Louis J. Taber, Master of the National Grange, in his address before the annual session of that body, at Winston-Salem on Nov. 16, 1932. He continued:

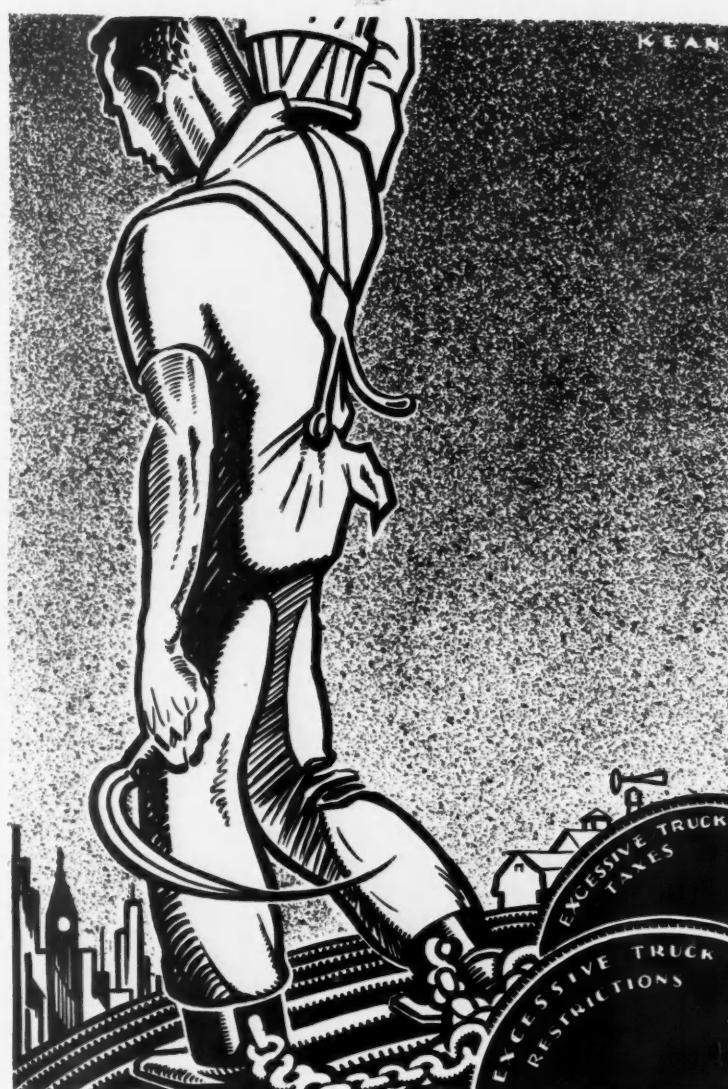
"We cannot favor a program of taxation or regulation that seeks to stabilize at high levels transportation costs. Rather than put unnecessary restriction on truck development, it may be well to relieve the railroads from restrictions and red tape which hinder them from meeting competition."

This is, briefly, the attitude of the farmer on the present very pertinent question of the relationship of motor transportation to rail transportation. As further evidence of this I quote from a recent article by Chester H. Gray, Washington representative of the American Farm Bureau Federation:

"It is my firm belief that the farmer must call a halt on these tendencies (excessive gasoline taxes and unnecessary restrictions) or he will let slip his great opportunity to get cheaper and more convenient transportation for the products of his farm and the supplies he needs on his farm.

"Farmers hold no brief for buses and trucks, but they want newer methods of transportation as they develop to be free from the incumbrances which the older methods are troubled with. If there is opportunity to get cheaper rates from the use of buses and trucks, farmers and others want such cheaper rates."

During the past ten years the modern motor truck has made for itself an indispensable place among the bet-



ter farmers of the United States.

The census of 1930 reported over 900,000 motor trucks on farms, and in the two years since that survey was made, according to sales records, this number has been increased somewhat even in spite of the poor economic conditions prevailing throughout the nation.

While farm leaders realize that they must continue to depend on the railroads for the long hauls and for the transportation of most of their bulky products, and are therefore concerned over the present financial difficulties of the railroads, they are not in the least impressed by the arguments of those who maintain that higher cost factors should be laid on the trucks

in order to "equalize conditions of competition" for the railroads. In fact, they criticize the railroads for keeping general freight rates at approximately 155 per cent of the pre-war level, while farm crop prices are only about 50 per cent of pre-war.

Neither are farm leaders impressed by the alarm spread by the railroads to the effect that motor traffic is "subsidized"—that the taxpayer is paying for the roads. In the first place, the farmer remembers that he has himself been a heavy taxpayer for a good long time. He sees in the cheaper transportation afforded by motor vehicles a chance to get back some dividends on his many years of tax investment. In the second place, the

better informed farmers know that motor vehicle users are paying out of license fees and gasoline taxes the bulk of all the present annual costs of building and maintaining the hard surfaced roads, as well as making contributions toward the construction of the county and local roads. In many states farmers are undertaking to see to it this winter that a larger percentage of these funds are spent on the county and local roads and local taxes thus somewhat relieved.

The railroads' argument that motor vehicle owners should pay something additional as a contribution to government, falls flat in the farmer's mind when he thinks of the terrific property taxes he pays, including property taxes on his automobile, truck, tractor and garage.

Farm leaders will insist that proper restrictions on size, weight and speed be adopted and enforced; they are willing to ease up on some of the restrictions on the railroads that may be limiting their field of usefulness or their ability to economize and give lower rates; but they have every intention of fighting to the limit any legislation tending unnecessarily to restrict the use of motor vehicles or to lay needless burdens of expense upon them.

Farmers have found the truck a real friend and valuable servant in the business of trying to wring a living from the soil. Motor trucks, large and small, are used for many tasks around the farm but their greatest value has been found to be in handling the farm products and getting them to market, elevator, warehouse or port, in the most economical manner and with the least amount of difficulty or delay.

Growers of fruits and vegetables have found that the motor truck puts them in touch with many more markets than were available to them with the horse and wagon or via the freight or express train. Many commercial apple growers, for instance, find that they are often able to truck their fruit direct from the local packing plant to nearby cities and towns, sell it at a moderate price and make greater profits than by sending the entire crop to the larger cities in carload lots.

Trucks Greatest Factor

Transportation costs are, and have always been, one of the greatest factors in marketing farm products and the motor truck tends to simplify as well as cheapen this step in marketing.

When a grower or shipper uses a motor truck to transport his products to the markets he eliminates at least two handlings en route, as compared with shipping by rail or boat. He sees his products loaded onto the carrier which will deliver them to the final destination and he can have complete control over them all the way if he chooses, by accompanying the truck or, better still, by owning and driving his own truck to market.

Fresh vegetables and fruits can be left in the field or orchard much longer than if they are to be shipped by other means of transportation, and yet they will arrive on the market earlier and therefore in much better condition.

Evidence of the usefulness and adaptability of the truck to the farmer's needs is found in the ever-increasing arrivals of produce by motor truck at our city markets. At Philadelphia the fruits and vegetables arriving by motor truck in August and September, 1932, were more than twice as great as those arriving by rail, according to reports of the United States Department of Agriculture. Motor trucks hauled in 38 per cent of all the fruits and vegetables received at this market on which any record could be kept, during the first ten months of 1932. Many truck-loads brought in by farmers which were delivered direct to retailers or consumers were, of course, not included in the reports mentioned. This is at least 20 per cent more than were trucked to the Philadelphia market during the same period of 1931. Motor truck receipts of fruits and vegetables at New York markets increased 28 per cent in 1932 over 1931. Three times as much fresh farm produce arrives at Los Angeles in motor trucks as is received by any other means of transportation.

Increased 500 Per Cent

Surveys of all the important livestock markets during the past few years also show a steady increase in the percentage of livestock of all kinds arriving at the market by motor truck. The total shipments of livestock to all markets throughout the United States by means of motor trucks increased 500 per cent between the years 1920 and 1930. Approximately 3,000,000 tons of livestock were trucked from growers to 16 important markets in the United States during 1931, according to the National Livestock Marketing Association.

Many local shipping associations have purchased trucks and hired drivers to operate them in order to give their farmer members the best possible cooperative marketing service.

The natural desire of the average American for independence of action, as well as speed, is one of the most influential factors governing the use of the motor truck in marketing livestock and other farm products. By truck the farmer can get his products to market at the exact time he chooses and can go in much less time than is necessary when shipping by rail. And, not the least important by any means, he can get his money the same day. He can get to market within a short time after receiving the market quotations by radio or telephone if desired, or this same information may warn him to hold his stock or other products off the market for a time. He can go to market leisurely between

the light of two days if he wishes, thus saving livestock from weight loss and the danger of overheating, and also enjoying the freedom of an uncrowded highway. Such use also makes the truck available for other uses during a part of the daylight hours if desired.

Vast amounts of cotton are hauled by motor truck each year from the cotton belt to Galveston, New Orleans, and other ports along the Gulf and South Atlantic coasts. Cotton seed, too, is being trucked direct to oil mills in ever-increasing tonnage, saving time and money for the cotton planter.

Transporting milk and cream by motor truck is a well established business and some large cities depend almost entirely upon glass-lined tank trucks for their daily supply of milk. Of course these are not "farm" trucks but they are filled with the product of the farmers' work. Many dairy farmers find the motor truck indispensable in getting their cream to the creamery. In some neighborhoods this business is, of course, handled for the farmers by regular trucking companies that operate cream collection routes on regular schedules.

Poultry and eggs are also important cargo transported from producer to consumer all the way by motor trucks.

In many sections of the United States there are now established egg routes and packing plants depending entirely upon the motor truck for their existence and their ability to operate. Trucks owned by these agencies—oftentimes a cooperative organization of farmers—cover the entire section from which it is desired to collect fresh eggs, running on regularly scheduled routes, picking up fresh eggs direct from the farms designated to produce eggs for that particular agency and taking them to the central packing house. After inspection, grading and packing, larger trucks rush these guaranteed fresh eggs to the large consuming centers, providing a high quality product at a reasonable price. Without the motor truck such efficiency could not be approached, particularly in the matter of concentrating large quantities of fresh, good quality eggs at the packing plants.

Big Egg Shipments

Twenty-two per cent of all the eggs reported to the United States Department of Agriculture as received by dealers at Chicago during the first ten months of 1932, arrived by motor truck. Of course many more truck loads of eggs went to local grocers, markets, brokers and others but were not reported to the government agents. Motor truck receipts of eggs at New York increased 33 per cent during the first ten months of 1932, as compared with the same months of 1931.

Large quantities of live poultry also are received by motor truck at all the large markets.

COORDINATION OF TRANSPORT SERVICES AS IT STANDS TODAY

By G. LLOYD WILSON

University of Pennsylvania

THE term "coordination" means the bringing of all types of carriers into an orderly basis of relationship and the combination of the various types of carriers into unified and harmonious action. It means the adoption and adaption of motor carriers into a general system of transportation in which each type of carrier has its place determined by its peculiar efficiency to perform certain types of transportation services. It does not mean the domination of motor transportation by other types of carriers, nor does it imply the stultification of the usefulness of motor transportation or regulatory bodies which would subordinate the motor carriers to a position inferior to other agencies of transportation.

The coordination of motor transportation with other forms of transportation can be effected in several ways.

First, through the direct ownership and operation of motor vehicles by railroads, electric railways, or steamship lines, to supplement, extend or improve the transportation services of these carriers. Second, motor vehicles may be owned and operated by subsidiary companies controlled by parent railroad, electric railways or steamship companies. Third, motor vehicles may be used in coordinated transportation services, the vehicles being owned and operated by motor trucking companies which act as agents for railroad, steamship or electric railway companies. Fourth, and finally, coordinated motor transportation services may be established by joint through-route-and-rate arrangements between motor carriers and railroad, electric railway and steamship carriers.

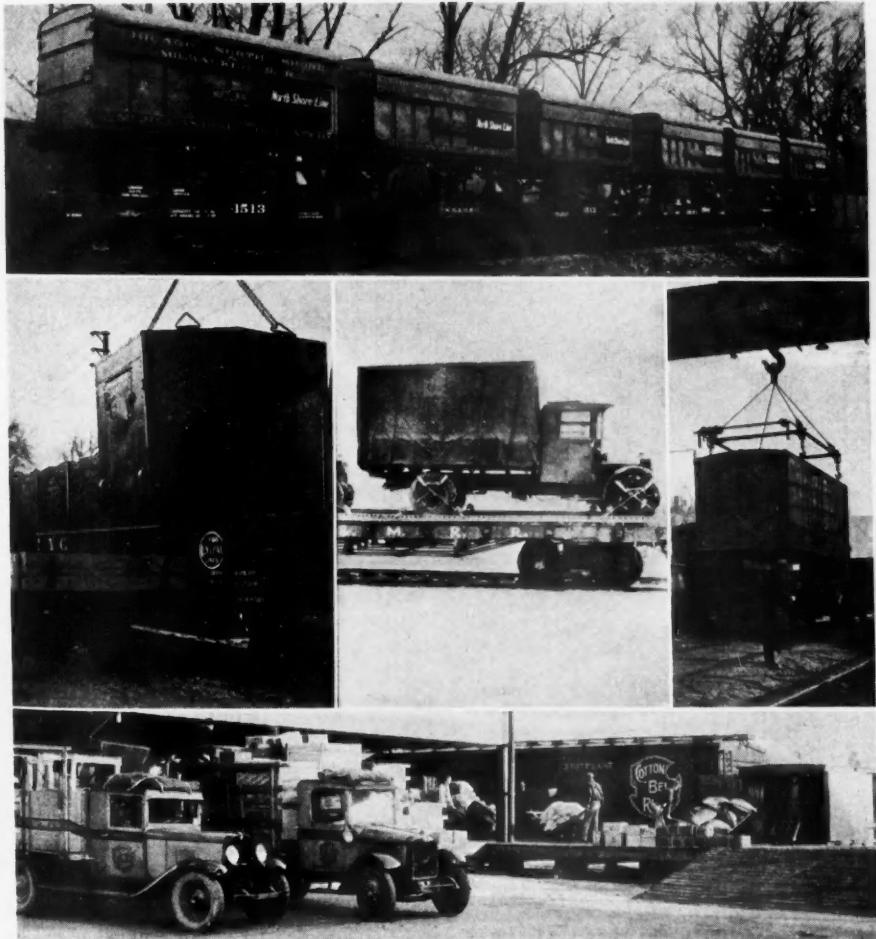
The form of ownership and control is material, the essential feature of coordination is that the motor vehicle, railroad, electric railway and steamship lines are fitted together as parts of an integrated system.

THE ADVANTAGES OF COORDINATION

The advantages of coordination, in the true sense in which the term is used, should accrue to three groups: first, to the rail or other older established carriers; second, to the motor transport carriers, and third, to the public.

Coordination benefits these interests by:

1. Providing a better working relationship among the carriers.
2. Eliminating mutually destructive competition.
3. Enabling each type of carrier to be used for the services in which it is relatively efficient.
4. Improving the door-to-door speed of transportation services.
5. Reducing loss and damage of goods.
6. Reducing the total costs of transportation.
7. Simplifying the arrangements for transportation services.



It is impossible to estimate the exact number of motor carriers or motor vehicles used in all forms of coordinated transportation service, but the number is steadily increasing. The following figures indicate the progress that has been made in the past half dozen years in the use of motor trucks by steam railroads:

Year	Number of Railroads Using Trucks	Number Trucks Operated
1926	20	1600
1927	30	3300
1928	45	4900
1929	55	5900
1930	60	7000
1931	85	10000

These figures do not take in consideration the fleet of between 9000 and 10,000 motor freight vehicles operated by the Railway Express Agency, Inc., a corporation, the capital of which is \$10,000,000.

Five forms of railroad-highway coordination. The top and center views show the ferry truck service of the Chicago North Shore and Milwaukee Railroad. Loaded trailers or trucks are locked on flat cars. The left center view shows a loaded container of the N. Y. Central being transferred to a truck. The Pennsylvania Railroad uses both the container and trailer body service; the latter type is shown at the right. The St. Louis Southwestern Railway Lines (lower view) uses trucks in its Blue Streak service to reduce station stops per run.

RESTRICTIVE REGULATION WON'T BENEFIT PUBLIC



WHILE the legal technicalities which arise in connection with the various statutes or proposals for legislative regulation of motor carriers are primarily of interest to lawyers concerned as specialists in these problems, certain practical considerations which should be considered in forming opinions as to the advisability of the enactment or modification of such legislation may be worth setting down.

At the outset it should be made clear that we are here talking of regulation in the sense of control by the State of the right to engage in the business of motor carriage and of the details of conducting such a business, with respect to rates, service, accounting, financial responsibility and the like—in short, with the relation of the carrier to his customer. We are not discussing control by the State of the

By LARUE BROWN

Attorney-at-Law

TRUCKS give all industries service of a precise kind and at the precise time desired at a cost far below that offered by any other transportation service available. Regulation to be effective must be uniform but uniformity will destroy the individual characteristic that makes the truck such a valuable factor in industry.

Regulation should be in the public interest to promote highway transportation facilities and not for the purpose of truck repression to further the interests of other carriers.

The cost to the taxpayer of administrating a system of supervision to control the operation of motor vehicles owned by 2,500,000 owners would be tremendous, not to say impracticable.

Burdens which restrictive regulation will impose upon industry, the truckman who operates them and the taxpayer who pays the costs of bureaucracy certainly are placed in the public interest.

physical characteristics or method of operation of the vehicle.

Nor are we here discussing, in any detail, regulation in either sense of motor bus operation. Such operation is of necessity the furnishing of mass transportation and is a service in whose conduct individual necessities or convenience and individual bargaining can have no place. Since the service performed by the motor bus is essentially a regular common carrier service regularly conducted between fixed termini by a relatively small number of operators, it is of a character which lends itself without too serious strain to the control of uniform regulation. There is general agreement that there are certain possibilities of advantage from regulation of an essentially non-flexible type of service which may outweigh the difficulties and expense of effective enforcement of such regulation. With this view, there is no occasion to differ.

Where, however, it is proposed to subject motor truck service to similar control, very different considerations apply. Except as to strictly common carrier regular route service which comprises less than 6 per cent of all truck service, it is plain that the great economic advantage which the motor truck has been able to give to industry has been the provision of individual service of the precise kind

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A PLAGUE OF TAXATION MENACES MOTOR TRUCKS

By STEPHEN D. BRYCE

National Automobile Chamber of Commerce

LEISLATURES of 44 states will meet in 1933.

Opponents of highway transportation have already prepared measures to strangle motor transportation with excessive taxation.

Their argument that motor transport is subsidized is not tenable in the light of these important facts:

- (1) Special taxes paid by owners of trucks in 1932 exceeded the total tax paid by railroads on their freight and passenger operations.
- (2) Total special taxes paid by all highway users for the same period were approximately four times the aggregate tax credited to rail operations.

Automotive interests must meet the challenge with organized resistance and an informed public.

FINAL figures on motor vehicle taxation in 1932 are not yet available. However, data from the U. S. Treasury Department, the Bureau of Public Roads, the treasury departments of the various states, and other official sources have already established the fact that the total taxes collected by national, state and local governments from motor vehicle owners advanced to a new all-time high of approximately \$1,085,000,000.

Of this amount, it is estimated that motor vehicle taxes collected from owners of the country's fleet of 3,231,000 trucks (representing 13 per cent of the total motor vehicle registration) aggregated \$290,000,000, or, more than 27 per cent of all motor vehicle taxes.

At this point, it should be mentioned that the latest monthly reports of the Interstate Commerce Commission have established the fact that total tax payments by all Class I railroads during 1932 did not greatly exceed \$260,000,000.

On this basis, it becomes evident that in reality the annual tax payments of highway users which Colonel Thom and his associates are so anxious to ignore amounted to four times the taxes of all Class I railroads. Incidentally, these motor vehicle taxes represent almost double the amount which vehicle manufacturers received for their combined 1932 output including 181,000 units which were ab-

sorbed in markets outside of the United States. This astonishing circumstance might well give rise to speculation as to whether the vehicle manufacturers or Government receives the greater share of the highway user's dollar. And, well it might.

Another interesting comparison suggested by these figures reveals that owners of trucks paid in taxes on their vehicles an amount greater by at least

thirty million dollars than the total taxes paid by all railroads! Yet, the total operation of all trucks during the year, assuming that the ratio for the preceding year (the latest year for which adequate figures are available) accounted for a freight, commodity and merchandise movement of less than one-twentieth of the gross revenue ton-mileage moved by the

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Restrictive Regulation Won't Benefit Public

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and at the precise time desired by the shipper at a cost which, considering the factors of time and convenience, is frequently far below that offered him by any other form of transportation service available to him.

Regulation to be effective must necessarily tend to destroy this great service to American industry. Its practical difficulties in a country in which 2,500,000 individual operators each own a single vehicle are in any event so great and complex as to make efficient control almost impossible. These difficulties would be immeasurably increased if any thorough-going attempt were made to permit individual treatment by operator and shipper of their individual problems. Regulation which accomplishes anything more than the gathering of information must tend in the direction of uniformity. Uniformity must tend to destroy the great advantage to the shipper which has resulted in his increasing recourse to this agency of modern individual transportation.

The shipping public may well consider this fact. It should also consider another necessary effect of regulation in the form now becoming popular. Texas lately provided:

1. That truckmen may be refused the right to do business under private contract with shippers if in the opinion of a State Commission the effect will be to impair the efficiency of "existing common carrier service"—including railroad service.

2. If a truckman is permitted to do business under private contract he must charge as much as the common carrier does for similar service.

In short, the individual service which many shippers have found of great value to them may be taken from them at the discretion of a public administrative board. Even if it is still permitted its price will be, as indicated by Texas experience, substantially raised to the shipper and the rate is no longer to be fixed upon considerations of the cost of the service to the operator or its value to the shipper, but upon considerations affecting "other common carriers."

But this is not all. The small shipper may then have to give up this individual service or pay an excessive price for it. His powerful competitor, however, has no such hard choice. He can buy or lease his own equipment and thereby increase his competitive advantage. There is here a fundamental problem of national economics.

It should be plainly understood that state control of this type represents the end to which the efforts of those who advocate "regulation" are more and more tending. Plainly it is the type to which the principal advocates

—those who believe it desirable "to restore traffic to the rails"—will find most conducive to that end. The Texas statute has already been imitated in more than one state.

It is unnecessary to deny that regulation, at least of the common carrier, regular route, truck operation may have some theoretical advantages provided the free use of individual service is preserved to the shipper who needs it. It may, however, be laid down as a fundamental proposition that whatever regulation is imposed should be in the public interest to promote the sound development of highway transport facilities and not for the purpose of repression or strangulation.

Yet such repression or strangulation is in many cases an avowed, and in nearly all cases an implicit, purpose of those who seek and defend this type of regulation. In fact, the whole legal support of the recent discussion of the Supreme Court sustaining the Texas legislation seems to be that its effect will be repression—if not strangulation; that it will reduce the number of vehicles on the highways and thereby tend to preserve the highways.

The engineering support for this contention, where modern highways are concerned, seems, if one accepts the conclusions of the U. S. Bureau of Public Roads, rather slender. Moreover, the loss of maintenance revenue—in gasoline and other taxation—from the trucks thus driven off the roads must more than offset any possible savings in maintenance.

A more serious off-setting factor from the point of view of the taxpayer is the cost of administering a system of police supervision necessary to control the operation of millions of vehicles by millions of individuals. In the opinions of many, railroad regulation itself has not been a success commensurate with its enormous cost. Yet 85 per cent of the railroad mileage is controlled by 15 systems and there are 2,500,000 individual truck owners who own *one* vehicle each.

It is manifest that the railroad problem is a major problem of fundamental importance to the country. It is by no means so clear that the influence of truck competition is a major factor in that problem. Railroad statistics relating to current operations must be read in the light of general business conditions. But the Interstate Commerce Commission has estimated (Docket 23,400) that in 1929 the trucks moved, in intercity traffic, about 6 per cent of the tonnage moved by rail. Nor does the railroad answer that this was "the cream of the business" seem very convincing in view of the further finding that this truck movement amounted only to about 8 per cent of railroad freight revenue.

As a matter of fact, the tonnage moved by truck was in large measure less than carload short-haul traffic which, because of the heavy proportion of terminal and accounting expense, yielded very little *net* revenue to the rail carrier. As a further matter

of fact, much of the intercity traffic handled by truck was traffic which was not competitive with the railroads and of that which was competitive, a very large part was carried by privately owned and operated trucks.

It follows that the case for restrictive regulation is far from being proved by alarming assertion as to the effect of the truck upon the investment of the railroad security holders. On the other hand, the burdens which it will impose upon industry which uses trucks, the truckman who operates them and the taxpayer who pays the costs of bureaucracy, attest that the proposition of such regulation is not consonant with the public interest.

It should also be borne in mind by those considering the problem that the end which is sought by the railroads in their agitation for restrictive legislation of motor truck service will be only partially served when the carrier for hire is driven from the highways. The next and obvious step will be an effort to limit in like manner the privately owned truck used exclusively in the service of its owner.

Once the country is committed to the principle of controlling all traffic movement by legislation and not by competition, we shall be embarked upon an experiment whose complications and end no man can foresee.

A Plague of Taxation Menaces Motor Trucks

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rail facilities! In other words, railroads handling more than 20 times as much revenue traffic as the trucks paid in taxes 30 million dollars less than was paid by their "competitors". Nor, should it be overlooked that the \$260,000,000 tax bill estimated for the railroads represents the taxes paid on passenger, as well as freight traffic. To obtain an accurate comparison of taxes paid by railroads and trucks, we would be justified in considering only that portion of the railroads' tax payment represented by their freight operations.

It is also important to remember that the truck statistics just cited embrace *all* trucks, of which something more than 75 per cent are 1½-ton, light-duty type used so commonly by neighborhood merchants, small factories and farmers in services confined to very limited areas.

Perhaps the most potent statement of the trucks' case with respect to taxation is that of Thomas H. MacDonald, Chief of the U. S. Bureau of Public Roads, who, in his appearance before the Interstate Commerce Committee, testified, "In my judgment, the heavier trucks and buses by the higher tax which they are paying, and particularly through the collection of gasoline taxes, are fully meeting all excess costs of (highway) construction, due to the increased thickness (of pavement) that is made necessary for their heavier loads."

TRUCK LEGISLATION SHOOTS UP COST OF FEEDING THE PUBLIC

This statement of the importance of trucks and the effects of truck restrictions and taxation in the Kroger Company's operation may be considered typical of every chain and independent food store in the country. It shows clearly how unreasonable truck legislation affects the purse of every voter.

THE Kroger Grocery and Baking Co. operates a large grocery chain in the Middle Western section of the United States, from Pennsylvania on the east to Wisconsin on the west, Oklahoma City on the southwest to Virginia on the southeast.

This company finds it absolutely essential in its operations to use the most efficient form of motor transportation in distributing its merchandise from warehouse to stores, that is, a service that must under all circumstances be handled by motor transportation and could not, under any conditions, be accomplished by railroad or other means, inasmuch as the stores are located short distances apart and extend out for 50 or more miles from each branch warehouse. Door-to-door delivery is therefore of much importance and the success of the entire operation is dependent to a considerable degree upon the freedom with which reasonably sized vehicles with reasonable loads can be operated.

This company ships approximately 55,000 cars of freight by rail each year, and distributes this from warehouses to stores by truck.

We are therefore intensely interested in a satisfactory settlement of the controversy of the railroads and highway users on a just and satisfactory basis.

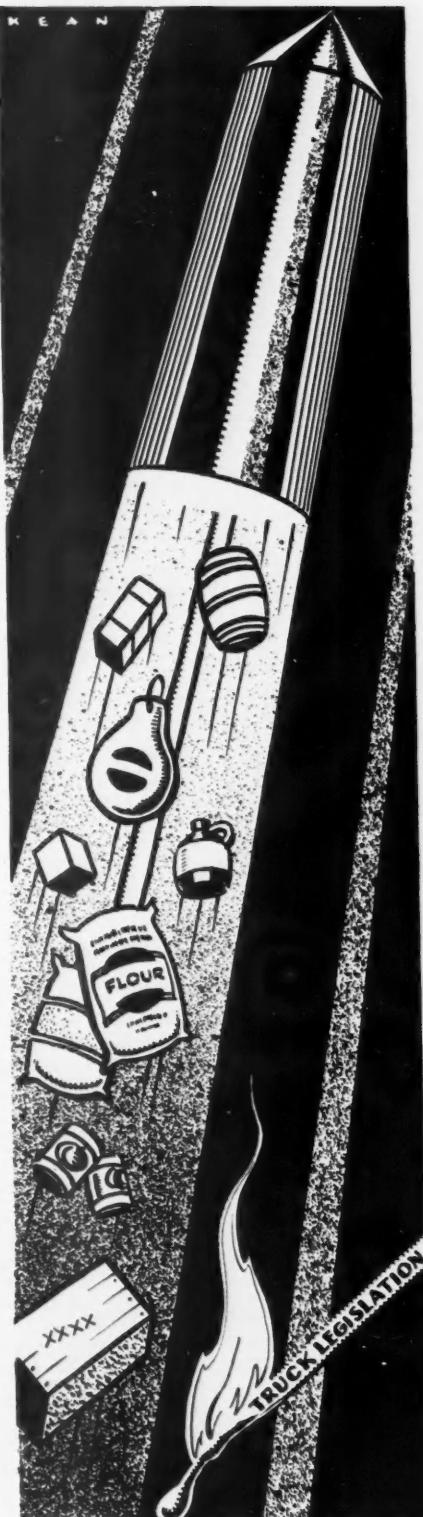
Economical distribution of merchandise to 4758 stores in 17 states requires the effective coordination of all forms of transportation. We have found that the motor truck is a vital part of this distribution machinery.

We have 21 concentration warehouses in 13 states. Each warehouse serves a group of individual stores ranging from 72 to 689. The transportation problem is one involving exactness in schedule, care in handling and economy. Railroads and waterways carry merchandise to these concentration points in economical heavy tonnage lots.

The motor truck is essential in the distribution of merchandise from the warehouse to the stores. This problem is one of handling efficiently many types of merchandise to widely scattered stores. The daily delivery of perishable merchandise to thousands of stores can only be accomplished

By COL. C. O. SHERRILL

Vice-President, The Kroger Grocery and Baking Company



Kroger Grocery Stores:

Ship 55,000 cars of freight by rail each year

Distribute this merchandise to 4758 stores in 17 States by truck

Find that daily delivery of perishables can only be accomplished economically by trucks

Estimates that restrictive legislation could easily increase truck hauling costs 25 per cent.

economically by the use of trucks and trailers.

Restrictive legislation is of vital interest to us, as its immediate effect is to increase our cost of distribution. The term "restrictive legislation" is of two types with reference to distribution cost:

1. Legislation that restricts the total payload that can be hauled by limiting gross weight, axle weight, length, width and height.
2. Legislation that imposes additional taxes.

Both of these forms of legislation increase transportation cost. Restriction of payload very often is the most important factor in the increase of trucking cost. An example will clearly show the effect of this form of legislation. Under the former highway laws in one state, we were allowed a total gross weight of 40,000 pounds on a tractor-semi-trailer. Now a new law limits our gross weight to 30,000 pounds with a tractor-semi-trailer. There has been a decrease in payload of approximately 5000 pounds. On a haul of 200 miles, this would amount to an increase in cost per cwt. of 4 cents, which is an increase of more than 25 per cent in cost. This amount of restriction in payload is not more drastic than that which is proposed in many states. Its effect on distribution cost is enormous.

It is recognized that motor transportation must carry its fair share of state highway construction and maintenance. The amount of taxes paid by motor transportation is assuming huge proportions. In many states trucks now pay the following taxes:

1. State gasoline tax.
2. Federal gasoline tax.
3. State license tax.
4. City taxes.
5. Mileage or ton mile tax.
6. Interstate license tax.
7. Federal tax on transportation equipment (trucks, tires, tubes, etc.).

The amount of these taxes is constantly increasing. In some states increased taxes have added three to

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A COMPARISON OF TAXES PAID BY HIGHWAY USERS AND CLASS 1 STEAM RAILWAYS

BY HIGHWAY USERS

1929	\$928-MILLION
1930	\$1000-MILLION
1931	\$1025-MILLION

BY CLASS 1 STEAM RAILWAYS

1929	\$403-MILLION
1930	\$354-MILLION
1931	\$308-MILLION

MOTOR VEHICLE TAXES ARE MORE THAN THREE TIMES THE TAXES PAID BY CLASS 1 RAILROADS

NUMBER OF EMPLOYEES IN AUTOMOTIVE AND IN STEAM RAILWAY TRANSPORTATION

SOURCE U.S. CENSUS OF 1930.

AUTOMOTIVE TRANSPORT EMPLOYEES 2,500,248

CHAUFFEURS, TRUCK AND TRACTOR DRIVERS	MECHANICS	FACTORY LABORERS and OPERATIVES	LABORERS ROAD AND STREET	GARAGE WORKERS	DRIVERS TRUCKERS & CAB CO. 82,094 AUTO BLD. 10,507 TRUCK ROAD, STREET REPAIR SHOPS 31,815 GAS STATION WORKERS 1,000
972,418	394,188	285,674	307,027	143,310	39,050

NOTE: DOES NOT INCLUDE SALESMEN OR ALL TRUCK DRIVERS

STEAM RAILWAY EMPLOYEES - 1,271,653

LABORERS 435,058	ENGINEERS 171,051	MAKERS and CONSTRUCTORS 161,529	MECHANICS OPERATORS and INSPECTORS 126,644	INSTRUCTORS FOREMEN and SUPERVISORS 112,987	DRIVERS 80,040	OFFICIALS 1,830 CLERKS 4,823 FREIGHT STATION AGENTS 3,823 MISC. 43,042
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AUTOMOTIVE INDUSTRY EMPLOYS TWICE AS MANY AS THE STEAM RAILWAYS

ONE of the failures of democracy seems to be the reliance of the people upon the fancied ability of government to work some magical solution of their difficulties. It is from this order of intelligence that has arisen the plea for indiscriminate and unsound regulation of highway transportation. I do not, of course, refer to such regulation as is really necessary in the public interest—regulation, however, which should be essentially social in its import and not in any sense economic.

The origin of this agitation is simple to understand, but its implications are dangerous in the extreme. It arises, in the main, from the fact that the railroad industry has experienced a loss in traffic to the highway vehicle as well as a loss in traffic due to the depressed state of general business; that it is having difficulty meeting its fixed charges, let alone earning a satisfactory return on its invested capital; and that it is unable to meet highway competition effectively, partly because of restrictive regulation and partly because, at least to some extent, it is outmoded.

If we are to judge a policy by its fruits, the conclusion is inescapable that Government regulation, as we know it today, and as we are asked to consider it in terms of the automobile, is largely unwarranted and mostly harmful in its effects. And if the operation of an automobile must be wound around with the red tape of Government regulation of its traditional character, it will both add to the cost of living of the people and be of no particular benefit to the railroads, the automobile, or the public.

One of the difficulties about regulation is that once entered upon it is almost impossible to halt. First we

THE AUTOMOBILE'S TRANSPORTATION

start out to prevent discrimination. Then we have to establish rates. Then we have to know what the property is worth and what rate to establish to satisfy the investor. Then we have to forbid someone from entering the business because that would disrupt the system already established. And so on, until an unnecessary, unwieldy bureaucracy has been built up, sending out its tentacles in every direction.

It is such a system which has given birth to several doctrines of extremely questionable soundness at the present time. For example, that relating to valuation. Should not consideration be given to the proposition that properties are worth just what their service is worth to the country and not what it cost to build them or reproduce them regardless of the existence of other means of providing similar services? And in the matter of investment: Have we arrived at the stage in our economic development where railway investments must be protected at all cost, and given preferred consideration regardless of the repercussions of such a policy upon other lines of business and upon the development of improved transportation facilities of other kinds offering service to the American people? There is grave question as to the wisdom of an exaggerated calamity appeal on account

FACTS WHICH SHAKE THE CALAMITY APPEAL THAT MOTOR VEHICLES JEOPARDIZE HEAVY INVESTMENTS OF INSURANCE COMPANIES IN RAIL SECURITIES

Reserves in railroad bonds held by life insurance companies have declined from 36 per cent in 1906 to as low as 16 per cent today.

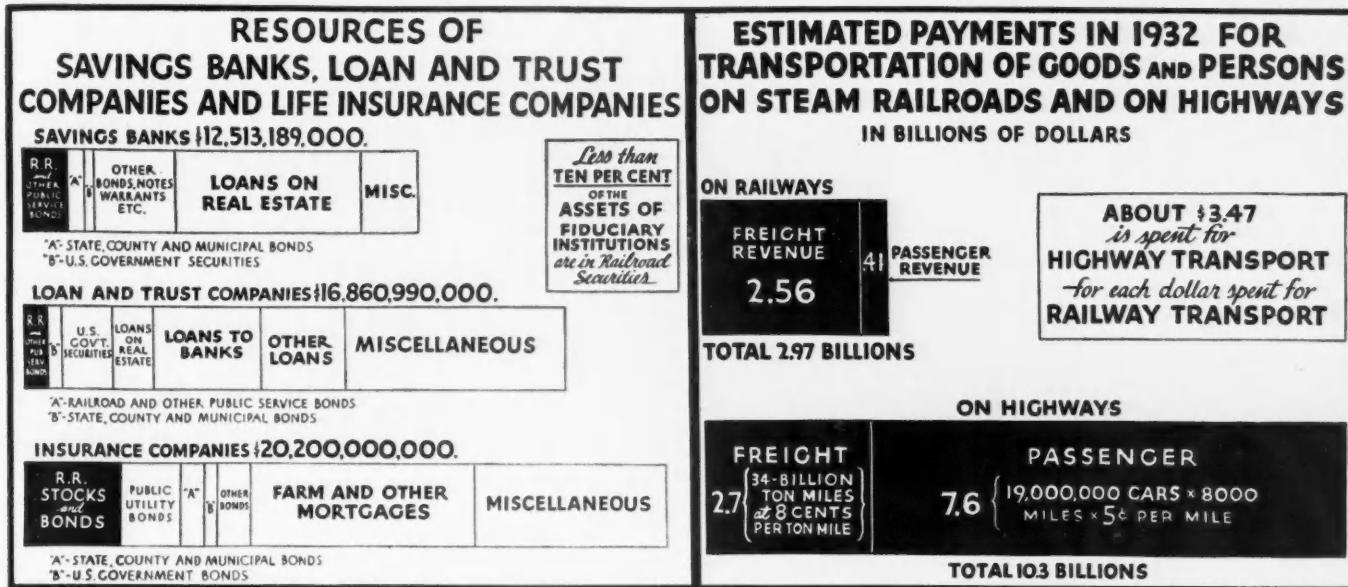
Should the inconceivable happen and all railroad bonds go in default the paper loss to the average policyholder would only be about \$48.

Motor vehicle owners of this country are paying in taxes more than \$1,000,000,000 a year.

of the investment of our insurance companies and other fiduciary institutions in railway securities.

It is doubtful that the facts will justify the implication of that appeal. In 1906 about 36 per cent of the reserves held by life insurance companies were in railway bonds, but the percentage has been declining steadily and is now only about 16 per cent. It can be readily figured out, of course, that if the wholly inconceivable happened and all the railway bonds in the country were in default, the paper loss to the average policyholder would be about \$48.

I do not believe that such doctrines should have any material weight in



CHALLENGE TO THE POLICY OF AMERICA

FACTS SHOWING HOW TRE-
MENDOUSLY IMPORTANT THE
MOTOR VEHICLE HAS BECOME
AS A TRANSPORTATION AGENCY
TO THE AMERICAN PEOPLE

In 1932 the movement of freight by trucks in the United States amounted to 34 billion ton-miles.

Truck transportation service in 1932 will approximate \$2,700,000,000 or slightly more than the estimated freight revenue of Class I railways of \$2,560,000,000.

For each \$1.00 expended with railroads for freight and passenger transportation \$3.50 is spent for motor vehicle highway transportation.

determining the country's transportation development and our public policy toward transportation agencies themselves.

It is advocated in some quarters that the rates charged by truckers be regulated by law. On account of the individual nature of truck haulage this rate regulation would be difficult. But let us look at the railway rate structure and consider if it is desirable to risk the imposition upon the truckers of such an unscientific, complicated and confusing thing as regulation has developed in the case of the railways. One of the maxims upon which railroad rate making has been based under this system is "to charge

what the traffic will bear." This means carrying some freight for less than the total cost of transportation.

The argument is that if an existing volume of traffic yields an income to cover all fixed charges, then additional traffic may be secured if it covers out-of-pocket expense. Rates are established which are below the total cost of transportation to meet boat competition, to meet competition from a rival railroad or to enable a commodity to be sold in a distant market. Of course where some merchandise is hauled at rates below the true cost, other merchandise must carry an excessive rate if the whole operation is to be profitable. So the trucker sometimes comes along and takes what the railroads claim is the cream of the traffic.

Then again regulatory commissions have approved certain rates in order to put certain cities, jobbers, or industries on alleged equality with their competitors. Of course this kind of rate regulation deprives certain cities and firms of economic advantages due to nearness to markets or raw materials. This kind of rate regulation, which seeks to keep everybody in business, is essentially uneconomic. It causes goods to be hauled by rail when they could be moved more cheaply by boat; it causes goods to be hauled

over circuitous routes when direct routes are available; it enables a distant producer of raw materials to out-sell a producer nearby; in general, it induces a maximum amount of traffic, while the interests of society require that traffic be kept to a minimum.

that trains be kept to a minimum. Instead of seeking to regulate rates charged by truckers, might it not be better to modify the existing rate structure of the railways? The inherent economics of truck transportation must eventually develop truck rates based primarily on the cost of the services rendered. If truck competition is disturbing to the existing railway rate structure because the railways have failed to give adequate consideration to the weight of the goods, or the distance hauled—because railways in the days when they largely monopolized the transportation service rendered in this country developed their rate structure under the theory that certain goods need not bear their full share of all charges—because rates charged various communities have been arbitrarily equalized regardless of the cost of the respective transportation service performed—should an inherently unsound railway rate structure be perpetuated at the expense of the public by extending its principles to the regulation of truck rates?

Is it not pertinent to inquire if the interest shown by railroads in the regulation of truck rates may not be primarily with a view to keeping them high?

If such is the case and if it is only

by arbitrarily increasing the cost of highway transport that traffic can be again diverted to the rails, is it in the public interest?

Altogether aside from the question of the practicability of regulating the automobile, it is not necessary to regulate it either as a monopoly or because of the rates which it charges. If you wish to ship goods by automobile and you think the trucker asks too much, you can readily get another trucker. No one has a vested right to serve your transportation needs. The conditions which gave birth to railway regulation do not apply at all to automobiles, and, as I have already stated, in large part their need as applied to railways has long since ceased to exist.

It is a question whether the average citizen realizes the extent to which various commissions which regulate highway transport at the present time are attempting to monopolize the use of the highways and to say that this man may drive his vehicle over the highway for a certain purpose but that that man may not do the same thing. In fact, one of the dangers which confronts us is that the highways, which are built and owned by the public, shall be monopolized and "farmed out" to certain firms and individuals. To what extent the practice of issuing certificates of convenience and necessity may enable certificated companies to become in this way "legalized" monopolies requires a careful inquiry before the country commits itself to such a policy.

The simple fact is that there exists no need for regulation of trucks, except in regard to matters of safety and adequate taxation. Whatever regulation is necessary should be altogether social in its character and not in any sense economic. Length of trucks on the highways should be limited so that a passenger car may pass the truck with safety. Trucks should be required to be equipped with safety appliances, lights, brakes, etc., and they should have such wheel equipment as not to damage the highways.

Highways and Taxes

In respect of such matters as automobile damage to the highway, automobile taxation, and even the use which the automobile makes of the highway, there is evidently much confusion of thought. The engineering facts are that a highway must be built of a certain thickness in order to withstand the effects of the elements, the warping and cracking due to the weather and seasonal changes. When the road has been made thick enough to stand all of this, it is equally able to transport anything up to and including a three-ton truck on pneumatic tires without any damage whatsoever to the road. The destructive factor is not weight or size but the pressure per square inch of tire surface in contact with the road. Thus a 10-ton truck equipped with six pneu-

matic tires might exert on a highway a much smaller pressure per square inch than a five-ton truck equipped with only four wheels and four tires.

When the automobile appeared, it became necessary to build better and more desirable highways, and the general practice obtained of using the money from license fees and gasoline taxes to building and improving them. During the past few years, about one-half of the money required to build and maintain highways has been contributed by automobile owners in that form. The fact remains, however, that the highways, directly and indirectly, are necessary for the use of everybody and at least part of their upkeep is not an inconsistent charge against public funds.

Pays One Billion

Perhaps the proportion of highway funds secured from general taxation and from levies on automobile users should be changed. I do not know. That is a question for factual determination. That would seem to be little if any justification for regarding highway transportation as subsidized when already the automobile owners of this country are paying in taxes more than one billion dollars a year.

HIGHWAY USERS PAY TAXES SUFFICIENT TO MAINTAIN THE HIGHWAYS AND PAY 5% INTEREST ON THE INVESTMENT IN HIGHWAYS		
ANNUAL TAX ON HIGHWAY USERS \$1,025,000,000		
LICENSE FEES \$344,000,000	GASOLINE TAXES \$537,000,000	PER PROPR. MUNICIPAL TAXES \$45,000,000
ESTIMATED COST OF HIGHWAY MAINTENANCE WITH INTEREST \$1,125,000,000		
Maintenance \$500,000,000	Interest on 12½% Billion Dollars at 5% \$625,000,000	GOVERNMENT SUBSIDIES FOR HIGHWAY TRANSPORT ARE NEGLECTIBLE

In determining the place of the automobile in American transportation some consideration, it would seem, should be given to the changing character and conditions of modern life. A number of factors are operating to change the nature and volume of our transportation requirements.

Thus railway transportation is likely to be continually affected both by a reduction in total transportation and by a diversion to trucks, passenger automobiles, pipe lines, boats, etc.

It is doubtful whether the American people have any adequate conception of how tremendously important the automobile has become as a transportation agency, first on its own account and second as a stimulus to improved methods of distribution and transportation generally. Available statistical data afford only a partial basis for estimating either the volume or the character of this service.

Dodge Brothers Corporation, in connection with its extensive truck and bus business, have been for years in-

vestigating various factors in connection with the transport of merchandise by trucks, and their studies have developed many interesting and important facts upon which certain specific conclusions have been based. One conclusion from these studies is that in 1932 the movement of freight by trucks in the United States will amount to 34 billion ton-miles. This is approximately one-eighth of the total ton mileage of freight when railroad transport is included. Incidentally this represents a shrinkage in truck ton-miles of approximately 30 per cent from the peak of about 50 billion ton-miles hauled by trucks in 1929, a year of exceptional prosperity for railroads.

The comparative money valuation placed by the American people on truck and railroad transportation of merchandise is interesting. Truck transportation service in 1932 will aggregate approximately \$2,700,000,000.00 or slightly more than the estimated freight revenue of Class I railroads of \$2,560,000,000.00. The average ton-mile revenue of trucks is higher than the railroad average by several times over, but it must be considered that the truck revenue is secured from relatively short hauls, and from what would be classified by railroads as L. C. L. freight, upon which freight tariffs are higher. The important thing to note, however, is that this revenue was earned by trucks upon service that was either not available at all from railroads, or that was awarded to trucks competitively upon the value of the service rendered. In either event it represents a sound basis of evaluating the trucks' service to society.

A similar comparison of steam railway passenger revenue with an estimate of the expenditures on passenger car operations indicates an even greater preponderance of value awarded automobile passenger car transportation. Combining freight and passenger car figures, there is expended upon truck and automobile transportation, for freight and passengers, somewhere in the neighborhood of \$3.50 for each \$1.00 expended with steam railroads.

Public Concerned

It would seem only natural that, if the American people spend this huge sum for the transportation services performed by the automobile, they are vitally concerned in whatever affects a service which they appear to value so highly.

For a number of years Chrysler Corporation has kept a record of the occupations of the persons or firms buying its trucks. The occupational groups which have purchased over 5 per cent of its annual output of trucks are general truckers, grocers, department stores, miscellaneous retailers, dealers in milk and milk products, dry cleaners, dyers and laundrymen. The largest buyers are the general truck-

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Our Own Ear to the Ground Department

Stops Stalling

Several large milk dealers recently had the pleasure of driving a new Dodge house-to-house delivery job equipped with a hydraulic clutch. Pushing the accelerator gives a smooth start in any gear. When climbing steep hills lower gears than high may be required, as in conventional vehicles, but if the driver attempts the climb in high the truck will finally slow down and stop with the engine still running.

Look for Yourself

A glass spark plug which permits a mechanic to note the color of flame in engine cylinders is being tried out by large fleet operators. One reports that the plugs reveal uneven distribution of gas to individual cylinders. Occasional misses are revealed clearly.

Tunnels Out

The low floor level in the driver's compartment of most house-to-house delivery jobs makes it necessary to cover the propeller shaft with a steel "tunnel" which obstructs the passageway. One engineer is working on a design with the propeller shaft level all the way to the front and the power from the engine dropping down to the shaft after the manner of the FWD transfer drive. There will be no tunnel.

A Coasting Milk Unit

Coasting is one of the accomplishments of the International Harvester Model M-2 milk delivery unit. The vacuum-operated clutch releases as soon as the driver takes his foot off the accelerator. This permits him to stop and restart without throwing the gear lever in neutral or shifting into gear again.

Just 'Round the Corner

Power-operated clutches, brakes and other controls seem on the way. Power steering is probably not as far around the corner as prosperity.

Is \$500 Right?

We don't as yet know the prices of John Willys' new offerings, which include a four-cylinder light delivery. But our guess is that it will be priced less than, or at least very close to, \$500.

Getting Within the Law

Engineers spurred by threats of further legislative restrictions on weight are weighing relative advantages of lighter alloys or stronger alloys permitting smaller sections. In the former group are aluminum and even magnesium alloys and in the latter special steel, which will be just about as light as aluminum when made of comparable strength. Very light weight experimental trailers are being successfully operated in regular service.

Not Too Tough

Speaking of alloys, brake drums are being made of a new steel alloy containing a high percentage of manganese. Ordinary manganese alloys are so tough they cannot be machined, but heat-treatment makes it possible to overcome this characteristic.

Factory to Garage?

We are going to be rather interested to know how distribution is going to be handled if and when Continental Automobile Company announces a light delivery model on their new four-cylinder line. As you probably have heard there is going to be a lot of "direct-to-consumer" merchandising on this line of passenger cars. What about a light delivery, Mr. Krohn?

Cast Iron Crankshafts Again

Crankshafts of cast iron may appear in production during 1933. Not ordinary stove castings but alloy iron cast in a special design. The shafts are likely to be better and cheaper, say engineers working on the idea. Engineering experience shows that wear on ordinary crankpins takes place on the inner side, that is, opposite the side receiving the explosion. Cast iron shafts show a surprising increase in fatigue value over steel shafts when operated to destruction with the center main bearing purposely sprung .030 in. out of line, according to J. B. Fisher, chief engineer of Waukeisha. Other companies are known to be experimenting along these lines. It may be recalled that rumors predicted a cast iron crankshaft for the new Ford V8 and the ground-contacting ear stationed at Dearborn reports that the idea has not been abandoned.

Sumptin' New

One important company not far from Detroit will announce several new models and a completely new engine, which they build themselves, at the Chicago Show.

What's Your Guess?

Announcement of the Plymouth with a six-cylinder engine leaves the Chrysler group without a single four-cylinder engine in its passenger-car line. Which inspires a question about the type of engine to be used in 1933 in the Dodge trucks rated at from $\frac{1}{2}$ to $\frac{1}{2}$ tons now available with either fours or sixes. The e.t.g. prophet is making one guess. What is yours?—A.F.D.

THE OVERLOAD



Heah's an ovahload, suh, what am an ovahload. Right smack from deah ol' Alabammy.

Technocracy!

Looking over the preliminary facts and figures just issued by the N.A.C.C., and the 1932 truck production figures in particular, we are inclined to shout a loud "second the motion" to the observation of C. F. Kettering, of General Motors, when he said in defense of the machine age, "We suffer not from overproduction, but from under circulation."

The Regulatory Parade

As a protection to established merchants, who pay state, county and school taxes and in fairness to rail and motor common carriers certain

truck users will be required to pay an occupational tax if a measure to be presented to the next Texas Legislature by the Texas Industrial Traffic League is enacted into law. The law will apply to anyone, who buys merchandise at one point, hauls it to another point and sells it.

A Pink Slip

Here's a bit of evidence which proves that all's not blue that comes on a pink slip. It came as a printed memorandum from a well-known truck maker for sales department and not editorial consumption: "The belief is growing around here that every _____ salesman ought to receive Commercial Car Journal regularly for his own benefit**** Be sure that every salesman reads 'Stop Hand-Pressing Only; Get Back to Bare-Handed Selling' on page 17 **** be sure to read the article on rating formulas, page 26. That gives the kind of information by which problems, both theoretical and actual, are solved by successful truck salesmen. And so on—." Needless to say we are sold on such pink slips.

Nuthin Like the Real Thing

At last the much misused term "unique" has been given an opportunity to display itself in its true sense. To say the least, the splendid Chevrolet exhibit at the New York Show was unique. By means of real half-smokes, beautifully colored bananas, living gardenias, hard red bricks, nuts and bolts, cans of refrigerated milk, etc., the vocational versatility of the truck was demonstrated in a way as to satisfy even the most skeptic from Missouri. Besides filling the trucks with the real thing, posters suspended from the beams depicted the trucks as they appear in their various services.

Move Over, Please

Don't be surprised if a truck manufacturer comes out with a model equipped with a loud speaker close to the driver's seat. It is reported that the amplifier will play a prominent role in helping to overcome the resentment of the public toward the appearance of a truck on the highway. Signals of a motorist requesting the right of way will be instantly picked up by a receiver at the rear of a truck and transmitted to the driver.

Scrappy Advertising

Is it good advertising to fight for your rights and tell the world about it? Ralph J. Staehli, secretary of Allied Truck Owners, Inc., says yes and presents the story of one truck operator who noted an increase of 22 per cent in business above normal as the result of the advertising campaign put on by the highway users of Oregon in the recent battle against the railway proposal for a truck regulation bill to inform the public of the economic and industrial value of highways to each section of that state.

Rubinoff Leads Off

Pianists and violinists are preferred over all other instrumentalists in a national radio star popularity contest. Rubinoff, violinist, is the leading artist, but piano players lead with 28½ per cent of votes. These interesting facts are furnished by United American Bosch Corp.

The Fact of the Matter

The popular notion is that somebody, a flock of somebodies in fact, must do something to help the railroads. Daniel Willard, speaking with authority of the position of president of the Baltimore and Ohio brings the informal ideas down to earth with the statement "Our problems on the Baltimore and Ohio will disappear as business improves."—M.J.K.



22 FUNDAMENTALS TO GUIDE TRUCK REGULATORY THOUGHT

Effect of Highway Transport on Rail Freight

1. Sub-normal shipping by industry, mining and agriculture is the principal cause of low freight revenues of railroads.
2. The most stringent restrictions likely to be suggested for motor services whose business and rates might be adjudged subject to public regulation would bring no marked increase in rail net freight revenues.

3. It will require a study of net railroad earnings, rather than tonnage, and at a time when agriculture, mines and industry are producing in normal volume to get a true picture of railroad conditions as affected by the so-called motor competition.

4. No material approach to the real difficulties of the railroad industry can be found in "losses" to motor services since the major part of those services is for short distances that would produce small line haul earnings and disproportionate terminal expenses.

Should Motor Vehicles be "Regulated"

5. No increase in public expenditures for regulatory bureaus should be considered unless supported by the most urgent public necessity

As Expressed in a Memorandum filed by National Automobile Chamber of Commerce With National Transportation Committee

cared for according to local conditions and are being constantly perfected.

9. The uniform standards for dimensional control of motor vehicle operation set forth by the United States Bureau of Public Roads and the American Association of State Highway Officials should be approved by all state Legislatures in the interest of efficient transportation.

10. Any undue restrictions on contract or common carrier trucks would create an advantage to competing business served by its own trucks.

11. Regulation of railroads was founded on monopoly and was not at once adopted in its present form; any regulatory suggestion for motor transport should be approached slowly and carefully lest public interest suffer.

12. Any restrictions on motor transport founded only on an attempt to make motor services equal in cost the dissimilar rail-head to rail-head services would be unsound and ultimately futile; it would repress full development of motor transportation and only operate to the eventual disadvantage of the shipping public, the consumers, and the railroads as well.

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HEAVY GAS TAXES CRUSH GAS AND VEHICLE SALES

THE petroleum industry has this year provided an impressive demonstration of the ruinous effect of excessive taxation. High taxes have been resulting in decreased consumption of motor fuel and, in almost every state, lessened registration of motor cars. It is pretty generally realized now that gasoline is the most heavily taxed article of general consumption in the country; with the imposition, at the end of June, of a 1 cent Federal tax, the levies against it are, on an average for the whole country, equal to about a 100 per cent manufacturer's sales tax. There are few industries that could carry such a burden of public charges and survive.

The worst thing about it, however, concerns the inequalities in imposing the burden. Taxes range from 2 cents in some states to 7 cents in the highest group—besides the Federal tax. Then, city and county taxes, additional to all these, are getting increasingly fashionable. Counting these, the gasoline tax is actually as high as 12 cents in one place. Even if the consumer could stand it, this sort of thing is so utterly demoralizing to markets that it brings bootlegging, corruption and graft into the business.

When Congress enacted the Federal gasoline tax last summer some innocent people imagined that it would help to overcome the bootlegging and racketeering. They assumed that the

By J. HOWARD PEW

President, Sun Oil Company

THE EFFECT OF GAS TAXES ON GAS AND VEHICLE SALES

Number States	Gas Cents	Gas Sales	Car Sales
		Loss %	Loss %
12	3	1.3	1.2
17	4	5.4	4.5
9	5	8.9	5.5
5	6	9.2	} 9.0
2	7	13.3	

Federal authority would frighten the racketeers, who had defied the states, into being good. Of course, it had no such effect at all. The racketeers are so well organized and financed that they don't fear any authority. Only a day or two ago it was announced from Washington that frauds had been perpetrated against the customs duty on gasoline on a huge scale. Congress recently imposed a tariff of 2½ cents a gallon on imported gasoline, but the only effect was that the racketeers started importing naphtha instead of gasoline and selling it as motor fuel, the duty on naphtha being only ½ cent a gallon. This substitution of an inferior article is of course a fraud against the Government and the motorist; but it had assumed such proportions that the Government was compelled to raise the duty on naphtha to the same figure as that on gasoline.

The worst difficulty, as I see it, is that there is so much discrimination in the distribution of the tax burden. Taxes, of course, ought to be kept as moderate as possible; but it is even more important that they be equitably distributed. Three states and the District of Columbia tax gasoline only 2 cents a gallon; and in all these low-tax areas, gasoline consumption increased, during the first half of 1932, as compared to 1931, nearly 7 per cent. But as the rate of tax went up in other states, consumption went down. (See the tabulated figures.)

Now, it had become almost a rule, in normal times, that gasoline consumption would increase about 7 per cent a year; that was normal. Well, the states with a 2 cent tax showed just about that rate of increase this year; in all the others, consumption went down as the tax went up. There could hardly be a better demonstration that a gasoline tax at 2 cents is just about the ideal rate.

Whenever taxes get excessive and discriminatory in one industry, the effect is bound to be felt in others; thus the excessive levies against gasoline have been promptly reflected in a decrease in motor car registrations. Dividing the states into groups according to their rates of gasoline tax, we find that the number of cars registered in 1932 actually gained 1.3 per cent in the three states and District of

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The Legislative Wolf Is An Obstacle to Truck Progress

CONTINUED FROM PAGE 10

that he was not much interested in legislation.

This same manufacturer recently has been holding old-fashioned sales dynamiting sessions, old "Come-on-boys — we'll - show - 'em - how" stuff—taking midnight trains between points, without aiding much to clear the way for sales in this or any other territory.

We'll guarantee right now that his sales will keep on slipping and will continue to slip until the industry as a whole steps into this legislative picture determined to recognize that it is the biggest single obstacle to sales in the truck field today—even greater than the complacent assumption that business hasn't money to buy trucks.

The case of a woolen mill that has prospered on deflation, is an example. The depression made local markets for the mill and it was in the market for a truck. The truck was to serve in distributing semi-finished goods between a plant in Oregon and a plant 45 miles away in Washington.

Truck salesman Number 1, selling a small truck which, with a semi-trailer, could have handled the load, pointed out to the woolen manufacturer that heavier trucks would be barred after the passage of a railroad bill and that he would be foolish to buy anything but light equipment.

The second salesman assured the prospect that to carry his requirements, he would have to use a single truck of ample capacity as the railroad bill (he did not think that the railroad bill could be defeated) would bar the semi-trailer because of engineering requirements. The bill didn't do anything of the kind, but the prospect would have been just as doubtful about it as the salesman had he attempted to wade through the 6000-word railroad-initiated measure.

The issue was settled with the mill deciding not to buy a truck.

Until the legislative skies clear a contract carrier with an old over-hauled job is doing the hauling. The woolen mill owner is not proud of the equipment but in the meantime he is not going to invest his money in any equipment that may be confiscated by law in 60 days or else be subject to an expensive rebuilding job.

The logging business offers another example of the effect of legislation on a market. My friend in the truck business today would be foolish to sell a truck logger a piece of equipment. So would any factory branch or any dealer in this territory who expected to make anything on the sale of the highly specialized equipment required for the service and had only earning capacity to look to for sales security. This of course assumes that the deal would be a typical log truck deal, one-third down or 40 per cent down and the contract to pay out the rest of the purchase price of the truck.

In Washington and Oregon, coming sessions of the legislature are almost certain to work new regulations and restrictions on truck logging.

What assurance has the logger or the truck dealer back of him as to the nature of the final laws?

Neither manufacturer nor anyone else is making much of an effort, to date, to shape those laws. Will blind public prejudice, abetted by the railroads and their legal staffs, who see a chance to eliminate some trucks, guide that legislation onto the books, or will truck transportation experts make the few fundamental corrections that will satisfy public demand and still not disturb the operator or the dealer interest?

If the provisions of the late West-Railroad bill in Oregon had become law, 1800 log trucks in that state would have been tied up immediately. Finance companies, first, and dealers after the finance companies had hauled them back out of the woods, would have had a beautiful mess of used equipment to work and weep over.

This bill received but scant attention from purveyors to the transport industry except a small handful of dealers and equipment manufacturers and a few tire companies located on the ground, who visioned the chaos if that bill had passed. The loss to the industry through junked equipment and uncollectable supply accounts would, doubtless, have run well over \$500,000, without considering the value of the market for future sales eliminated by passage of that bill.

Yet, it didn't bother anyone very much except the operators who visioned their families in the bread lines and their life's stakes gone.

The picture might be carried even further. Back of every log truck on the highways of Oregon and Washington are 40 men and 40 families. That 40 includes the men in the timber, the fallers, buckers, loaders, skidders, swimmers and all the others. It includes the sawyers, sorters, carriage men, filers, pilers, handlers, checkers, and others in the mills that waited for the trucks to bring in the logs.

Fifteen thousand men would have followed the truck operators into the bread lines and a lot of private passenger cars would have gone back to the finance companies and dealers.

And, yet we're told this is an operators' battle!

Operators of Oregon, largely, except for the loyal seven dealers and factories back of them, staved off this calamity to the truck industry. Yet, it was everybody's battle, the battle of everyone who still thinks the automotive industry, in any form, is a field worth fighting for!

If one of the large tire companies supplying the hungry market in the log truck field had visioned some competitor getting away with \$100,000 annually of its market, it would have been much concerned. This bill if it had passed would have lopped off a quarter million market for rubber in

the logging industry alone. But no one was much concerned about it, except a few local tire dealers who visioned some of their pet accounts going off the books for good.

The effect of the bill on other carriers would have meant that in this one state alone a million dollar rubber market would have been cut off.

In every state within range the same conditions hold true.

The picture is not hopeless and some idea of a new day has appeared in recent weeks in the activity of the National Highway Users Association. This deserves every encouragement but more than that is required. This group is only a beginning.

The automotive industry is notoriously weak in its politics. It likes to assume that it is self-sufficient and it is not. The dealer-mortality in the depression should be one eye-opener. The ability of almost any commercial adversary to take the measure of the automotive industry politically should be another.

Oregon trucking won its first big battle politically only because it refused to apologize to the enemy and played the game just the way the railroads wanted to play it. The truck and allied industries in Oregon were saved a huge potential loss by recognizing legislative hazards as business handicaps and proceeding to remove them. The same thing can be done nationally, but it will never be done under a "let-George-do-it" plan.

That is the present attitude of most manufacturers of trucks and of allied products, and why their loss of markets will become embarrassing unless they put behind the legislative fight the active support of their entire factory and field organizations.

Automobile's Challenge to the American Transportation Policy

CONTINUED FROM PAGE 20

ers, but they buy only one-eighth of the output. Groups that buy between 5 and 3 per cent are wholesale bakers, contractors and retail bakers.

Those occupational groups that buy over 2 per cent of the output but less than 3 per cent are public utilities, manufacturers, gas and oil dealers, meat market and fish dealers and city, county and state institutions. It is perhaps reasonable to ask, as you look over this list, whether the people who buy these trucks are really in need of rate or monopoly regulation.

In the end, of course, the most economical forms of transportation will survive, preserving to the people of the country the benefits which each form can contribute in the field in which it is best adapted to serve.

How rapidly we arrive at a sound solution of America's transportation problem depends in large part upon our willingness to let economic forces rather than artificial restrictions determine the extent to which each mode of transportation will prevail.

VISCOOSITY CHANGE IN A PERFECT ENGINE REFLECTS OIL QUALITY

How Oil Acts in the Crankcase

Engine oils composed of a mixture of light and heavy oils increase in viscosity in crankcase service.

Ability of crankcase oil to resist decomposition by heat and agitation depends upon the rate of increase in viscosity.

Oils of high viscosity used in engines requiring low viscosity oil act the same in the crankcase and apparently have the same lubricating value, irrespective of their cost.

An engine depends upon crankcase oil for lubrication, not upon new oil.

PHYSICAL characteristics of different engine oils vary decidedly even though oil chosen for comparison may have the same viscosity. If a quantity of light oil and a quantity of heavy oil are mixed together to make a medium oil, the viscosity of this mixed oil will change more rapidly in use in an engine than an oil composed entirely of medium oil. In service in the engine, the light oils evaporate quickly leaving the heavier oils which are more likely to decompose than the oils of lower viscosity and they produce an excessive tarry or carbon deposit. Instead of a mixture of light and heavy oils, an oil may be compounded of a number of different oils graduated in viscosity from very light to very heavy.

Change in viscosity of an oil is due either to the engine or the oil, as was stated in the preceding article. If we use an engine known to be in excellent condition and adjustment throughout, change in viscosity of the oil will be due to the oil itself and not to engine condition. Therefore, the engine can be used as a laboratory to determine the relative lubricating value of different engine oils. In addition, it is possible to determine when the crankcase should be drained. We shall discuss the use of the engine as an oil testing machine in this article and take up the oil drainage period in a subsequent installment.

We ran a series of tests using different oils in an engine that had been completely overhauled, was maintained in the very best of mechanical condition and adjustment throughout the test, and was operated daily under identical conditions serving a delivery route. The four different engine oils selected for this experiment are designated A, B, C and D. Each oil was first tested for its viscosity when new and it was found that for all practical purposes they were the same. Each

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Unsuitable Oil Reveals Itself

This article and the accompanying charts, which are based upon actual tests, show how unsuitable oils reveal their shortcomings to keen observers. The test procedure which is of viscosity is simple but is not in the "rub-between-thumb-and-finger" class.

When to drain oil will be discussed by the author in a subsequent article, the third of a series.

By SILAS I. ROYAL

Lubrication Engineer and Oil Chemist

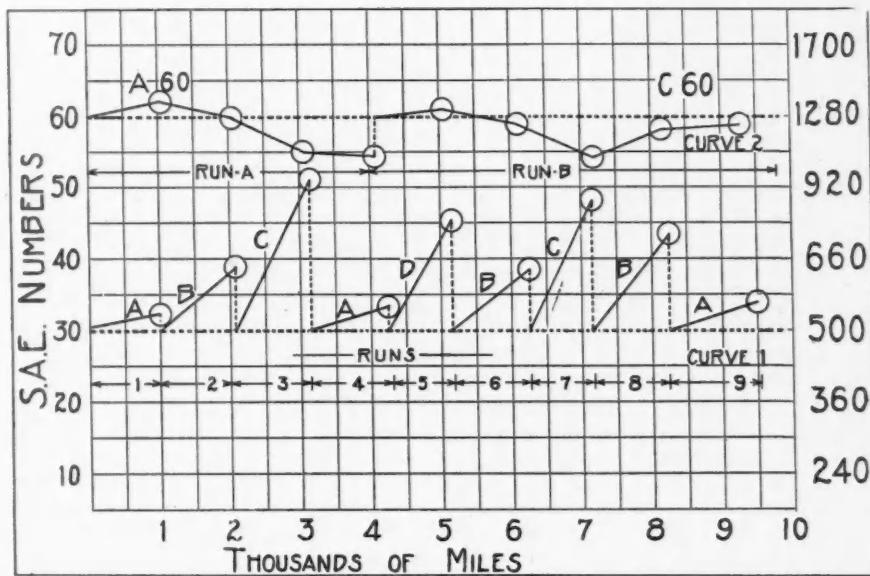


CHART 1. Lower curve shows increase in viscosity of different oils used in an engine in excellent condition. Oil A is an oil of known good quality. Upper curve shows action of good and poor oil of too high viscosity for the engine.

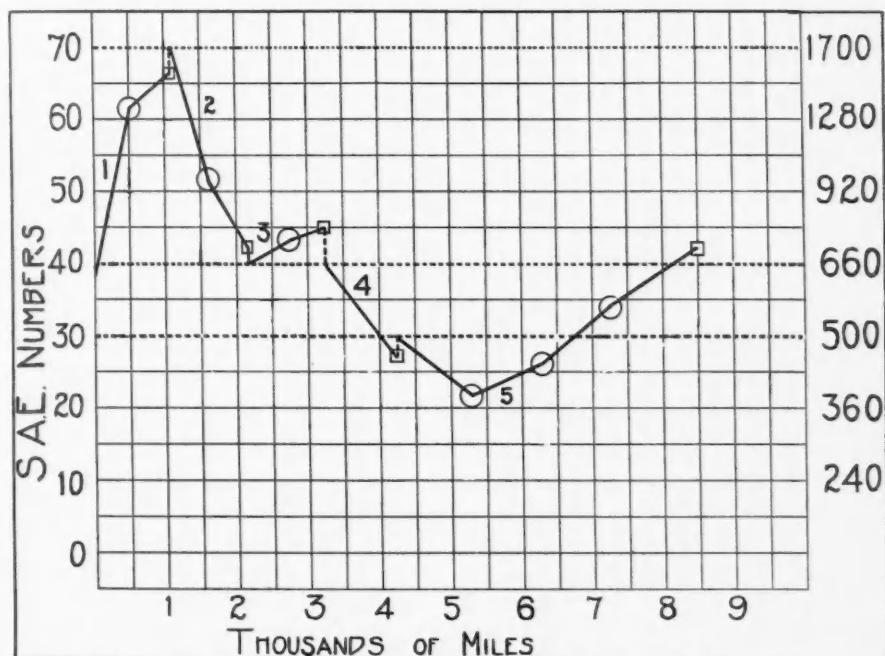


CHART 2. Change in viscosity caused by evaporation of pre-dilution (1), rich mixture and poor plugs (2), putting in new plugs (3), poor plugs again (4). Test run 5 shows dilution followed by evaporation of light ends in the oil leaving a heavy oil which continued to increase in viscosity. Figures on right of chart show the viscosity in Saybolt records.

Millions for Truck Industry Seen When Beer Flows Again



HOW much will the return of beer mean to the truck industry in dollars and cents?

R. A. Huber, vice-president of the United States Brewers Association and of the Anheuser Busch Brewing Co., is on record that brewers will spend \$15,000,000 for trucks the moment beer is legalized.

D. C. Fenner of the Mack company told the House Ways and Means Committee that in the first year after legalization the brewers will need about 5000 trucks costing about \$25,000,000.

Both these estimates consider only the sale of new trucks to the existing brewers—some 200-odd in number.

But to arrive at a more acceptable approximation of what beer will mean to the entire truck industry one must consider not only the sale of new trucks to the existing breweries but the sale of new trucks to new breweries which are certain to spring up; also how much may be spent to repair and overhaul truck equipment now in use; how much additional may be

spent for maintenance and operation, including salaries, insurance, gas, oil, tires, etc., and how much additional may be spent for garage and other equipment incidental to the operation and maintenance of vehicles.

Considering all these angles, the automotive industry stands to benefit to the tune of nearly \$43,000,000 from the existing 200-odd breweries alone, as shown in the tabulated survey in the adjoining column.

The estimates in the tabulation speak for themselves. Since they were submitted by brewers themselves, they possess a degree of authenticity which previous approximations have lacked.

It is interesting to note that in the matter of new truck sales, the survey estimate of \$13,788,000 checks closely with Mr. Huber's figure of \$15,000,000. The fact that it is way under Mr. Fenner's estimate of \$25,000,000 would seem to indicate—since both the breweries and Mr. Fenner agree that about 5000 trucks will be purchased—

Survey of 200 Breweries Show That They Will Spend More Than \$42,000,000 in the Automotive Industry

By GEORGE T. HOOK

Business from Beer

In this survey prepared for Commercial Car Journal, Morris R. Machol, manager of The Fleet Owner List Co., questioned the 200-odd breweries now operating in the United States, to find out their automotive requirements in the event beer is legalized. The analysis of answers he procured, follows:

1. Number of trucks owned ..	4,146
2. Number of trucks may buy	4,596
3. May spend for new trucks	\$13,788,000
4. Number automobiles owned	888
5. Number automobiles may buy ..	4,962
6. May spend for automobiles	\$2,977,000
7. May spend for repairing and overhauling present equipment ..	\$6,217,400
8. Additional per year may spend for automotive maintenance, including salaries, insurance, gas, oil, tires, etc. ..	\$14,687,000
9. May spend for garage and other equipment incidental to the operation and maintenance of motor vehicles	\$5,230,000
10. Total ..	\$42,899,400

that they plan to buy quite a number of trucks in the lighter capacities. Mr. Fenner's estimate appears to have been based on the assumption that trucks of five tons and up capacity would be purchased almost exclusively.

And yet it may be that the brewers, and not Mr. Fenner, will find themselves in error on their estimates if the modification of the Volstead Act takes such a form as to permit of distribution in barrels. In such an event the trucks of high tonnage rating would obviously win considerable preference.

All the estimates that have been quoted so far deal, of course, exclusively with the immediate prospects; with the potential among the 200-odd breweries now in operation. The larger prospect—the real potential—must not overlook the fact that with

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TRUCKING OF COAL FROM THE COLLIERY TO CONSUMER GROWS

An Impartial Discussion of the Development and Its Effect Upon the Coal Industry, Railroads and Truck Sales

By SPENCER A. JONES

Special Investigator

A Burning Question

Trucking coal from mine direct to the consumer has increased both in tonnage and average length of haul to such astounding proportions during the last 12 months as to excite considerable thought in all business circles directly affected.

Is the practice sound? How will it affect established channels of coal distribution? What will it do to producers, railroads, local coal dealers? What public support will it receive? Is the plan likely to become permanent or is it just another offspring of the Depression? And finally will it benefit or injure truck sales? These are some of the many questions that are being asked in many quarters.

Commercial Car Journal, sensing the many inquiries that would arise from the phenomenal mushroom growth of this new trucking development, decided to investigate. Its investigator spent days at the coal mines, on the highways and in various markets probing and studying. The results of his findings are not only interesting but contain facts from an economic and sales aspect highly significant to both makers and sellers of automotive equipment.

The study is presented in two parts. The first part, here presented, is a discussion of the development and its effects. The second, to appear in February, will be an analysis of economic phases of the operation, principally cost of operation, comparisons with established methods of distributing coal, and requirements for successful operation.

TRUCKING of coal from mine to consumer for distances of about 50 miles has been conducted profitably for several years, but it is only since 1930 that attempts have been made to increase the hauling radius. Even in 1931 there was comparatively little coal trucked for distances of more than 75 miles, but since January, 1932, both the hauling radius and the number of truckers engaged in the business have increased enormously.



An impartial investigation of coal truckers disclosed that approximately 1000 trucks are bringing mine-to-consumer coal into northern New Jersey, alone, where a \$2.19 per ton railroad freight rate on coal is in effect. The average load is about 4 tons per truck. A careful check at the three bridges spanning the Delaware river, over which the greater portion of the coal is trucked into northern New Jersey, showed that more than 2000 tons are hauled across one of these bridges every 24 hours. Most of the coal trucks carried New Jersey licenses, only.

A great many mine-to-consumer truckers were stopped on the highway and questioned during the investigation. Nearly all stated that the reason they were hauling coal was because they already owned trucks but had no other work for them. A few owners stated that they had purchased new equipment for hauling coal because they had heard it was a profitable business. Some truckers claimed to

carry insurance, but most were vague or entirely ignorant as to the kind or amount carried.

Not all of those engaged in trucking coal from the mines are small fry. The Pennsylvania Coal Terminal, a concern at Newburgh, N. Y., trucks coal direct from the mines and retails it to their customers locally. Mr. G. L. Vande Water, head of the enterprise, says:

"We are severely criticized, even called 'bootleggers', because we have established a method for retailing direct to the consumer, for less money, as good a grade of coal as can be bought in the city of Newburgh or any other city. By going direct to the mines with our own trucks we are able to effect savings which we pass on to our customers."

"Of course it is easy to understand why the local coal dealers do not like our being in business. They claim that they cannot meet our prices, due to plant overhead and their present method of handling coal. If their present

methods of trade can be beaten, then it is high time that they improve upon them."

Several of the larger concerns ostensibly engaged in the trucking and retailing of coal direct from mine to consumer are not actually owners or operators of trucks. They operate by making a deal with truck owners who are out of work. To these truckers they advance a certain amount of cash. The truckers drive to certain specified mines; buy the coal with the money advanced them, and haul the coal back to the concerns which advanced the money. The concerns then "buy" the loads of coal from the truckers at pre-arranged prices, but the sales are not actually consummated until the truckers have delivered the coal in the consumers' cellars. Such concerns secure consumers' orders through salesmen, but act only as "agents," which seems to relieve them from certain legal entanglements. The truckers, while they do not receive as much for their coal as if they solicited their own orders, are relieved of the expense of making sales, as well as having their coal purchases financed.

Retail coal dealers who own storage facilities, scales, delivery trucks and the other expensive paraphernalia of the established way of doing business complained heatedly to the investigator about the competition of mine-to-consumer truckers. One of the retailers who is on a committee to investigate ways and means of meeting trucker competition writes that "if nothing is done to stop this practice, it will only be a question of time when the producing companies will only be able to supply this territory (northern New Jersey) through truckers, railroad companies will lose their entire revenue from anthracite freight, and coal dealers be obliged to discard their yard equipment and also truck direct from the mines."

Railroad officials state that they are well aware coal is being trucked long distances from the anthracite mines, and consider their loss in revenue to be lamentably high. They, too, like the coal dealers, suggest that the consumer is the real loser because of the inferior quality of coal supplied by truckers, the shortweights and the loss in taxes.

The old line mine operators are said to maintain by mutual agreement what are known as "circular" prices. These "circular" prices appear to prevail for about 80 per cent of the anthracite coal mined. The balance of the anthracite coal is mined by so-called independents, and usually at somewhat lower prices.

The investigator interviewed the New York representatives of old line companies who claimed that their mines refused to sell to truckers, or that their prices to truckers were so high as to make long distance trucking unprofitable. Many old line companies, it was stated, are not even equipped with pockets for truck loading. As might be expected, the old line

company representatives accused the truckers of buying inferior coal from independent mines, and of delivering short-weight.

Through various channels the investigator was informed that some, but not all independent mines sell to truckers at prices which are attractive. He was told that, in general, the independent mines appear to be in favor of mine-to-consumer trucking even though they are not all in a position to sell to the truckers. The smaller independent operators, it was asserted, are the most active in promoting sales to truckers, their only complaint being that they cannot fill the trucks fast enough.

Then the investigator, posing as a trucker seeking sources of supply, visited the anthracite coal mining regions of Pennsylvania. Here he learned that most of the mine-to-consumer trucking into northern New Jersey originates in the Scranton region, although a small amount comes from the Lehigh fields. He made several attempts to purchase coal for trucking from old line companies, but in every case either a flat refusal was received, or else the prices quoted were higher than "circular" prices.

Glad-Handed by Independents

Then he went around among the independent mines, where he was given an entirely different reception. Practically all were willing, even anxious to sell to truckers. Not all, however, would quote prices which were attractive. It was at the "strip" mines, where veins are exposed near the surface, and at comparatively shallow workings, from which the coal can be removed at less cost than from the deep shafts of the larger workings, that the attractive prices were obtained. At all independent mines it was indignantly denied that their coal was in any way inferior in sizing or quality to that produced in old line operations.

He was told on good authority that one independent who is at present operating in Winton, Pa., has leased 1600 acres at Yatesville, Pa., where he is expecting to handle truck trade exclusively, supplying surface-mined coal.

Names of mines, prices paid and re-sale prices, which had previously been obtained by stopping and questioning truckers along the highways, were in practically every instance found to be truthfully given, when checked against the facts. In general, the price of coal delivered in the consumer's cellar by the trucker is about \$4.50 per ton higher than the price paid at the mine. For instance, independent mine prices of egg, stove and chestnut sizes are \$6 on the average, and the delivered price in the consumer's cellar is \$10.50 on the average.

It is this spread of \$4.50 per ton on which the mine-to-consumer trucker has to operate, as compared with the average spread of a trifle over \$5 per

ton out of which the established retailer pays freight, fixed charges, selling and retail delivery costs.

Truck manufacturers are becoming interested in the situation and its future possibilities. One manufacturer's branch manager recently issued the following bulletin:

"There is a mistaken belief that there is a lot of money to be made by individual operators purchasing new or second hand trucks and going direct to the mines for coal, to be hauled at great distances and sold to consumers, usually at lower than current coal prices.

"We, here, have lost a great many sales, because of our inability to determine how a healthy, profitable business could be built for this or any other company from this classification of users, especially at distances 50 miles or more from the mines and the purpose of this letter is to caution you against submitting any time deals to our Credit Department and in turn to our Collection Department, because we cannot consider the sale of a new or used truck to this class of users for any less than 40 per cent or 50 per cent cash down-payment, because of the fast depreciation and the probability of a repossession, due to the business ability of the customer involved.

"We doubt the wisdom of promoting sales to this class and if we do, we are unconsciously tearing down one of the finest markets we can hope to find, namely: the retail coal dealer.

"The coal dealer ranks at or near the top of the list when it comes to pay, practically 75 per cent of all truck purchases have been cash to date. His business usually is a neighborhood business, he is not prone to overloading and his equipment is not subject to fast deterioration, in fact we do not know of any class of business that is more worthwhile, more desirable than that of the retail coal industry.

"There is little that we, as a company, can do to stop the inroads of this irresponsible competition the coal men are everywhere confronting today, but we can at least make our trucks harder to buy for this use and thereby protect this company against losses, which are sure to result in the majority of sales to these independent haulers.

"Several coal dealers have found economy in truck and trailer operations from mines to their yards, and naturally this opinion does not apply to this class of work."

This truck manufacturer, and others, are adding a clause in lease contracts providing that time payments shall be made on a mileage or monthly basis, whichever is greater; the average allowable monthly mileage being much less than that customary in the mine-to-consumer trucking business.

Retail coal dealers criticize both the
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N.Y.C. SHOP SWEEPS OUT WASTEFUL REPAIR PRACTICES

Department of Sanitation
Uses 7 Devices in Cleaning Up Its Troublesome
and Time-Consuming Jobs

THE machine shop of the Department of Sanitation in the New York City Central Motor Repair Shop building has designed and built a large number of special jigs and fixtures to simplify specific operations which otherwise would be troublesome or time-consuming. Several of them are pullers for flanges and gears which are "worth their weight in gold."

This is the fifth of a series of articles describing the shop-made devices used in the three city department shops comprising the New York City Motor Repair Shop building, the world's largest fleet maintenance establishment. Another group of devices will be described in an early issue.

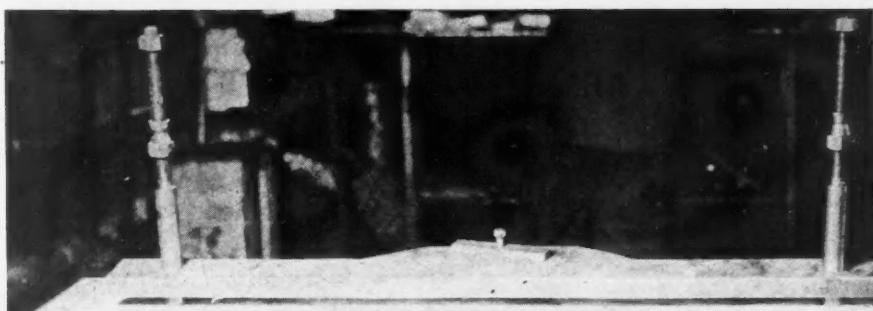
Revelation of this information is possible because of the courtesy of Albert Goldman, commissioner, Department of Plant and Structures; Dr. William Schroeder, Jr., chairman of the Sanitary Commission of the Department of Sanitation, and Edward P. Mulrooney, commissioner, Police Department.

Fig. 38—Engine Leg Welding Jig

This jig is used to insure alignment when welding broken engine legs on Pierce-Arrow crankcases. It comprises a flat bar with a threaded post at each end. Each post carries two cones which are centered in the holes through which

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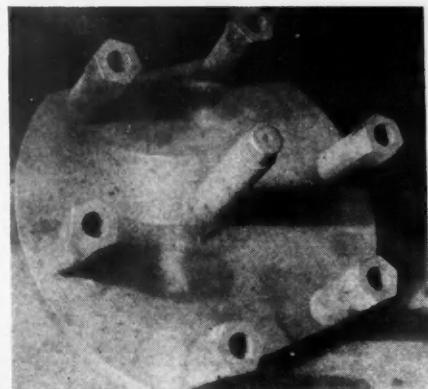
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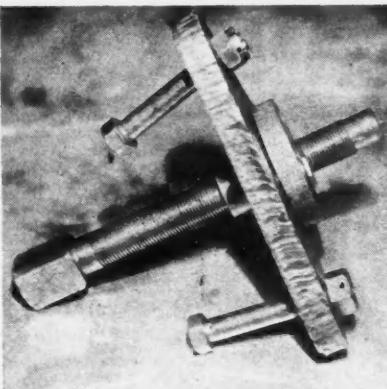
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IS THE SALESMAN'S PURSE IN NEED OF ADJUSTMENT?



Are Truck Salesmen Underpaid? Does Present System Attract Real Ability? Will Adjustment Increase Sales?

THE author is a sales manager with 16 years' experience in wholesale and retail selling of trucks. Salesmen now under him look upon him as a leader.

Here he discusses the problem of salesmen's compensation from the viewpoint of a sales manager who believes that if his employers wish him to fully realize his responsibilities to them, they must help him to realize his responsibilities to the salesmen under him.

Readers are invited to send their own views to the editor. To encourage frankness, names of discussers will be kept strictly confidential.

years' experience in retail selling know how highly essential correct mental attitude is to successful selling, and the best seasoned salesmen we have cannot go out day after day and do the job we expect of them and which they are capable of doing, if they are beset with financial worries and personal problems of a serious nature. Enthusiasm so highly necessary in sales work cannot be produced or maintained without a fair rate of compensation.

The sales executive is constantly striving for a larger percentage of the available volume and keeping sales costs down as low as possible at the same time. Effort in one direction is working against the other, for any gain in unit sales in a given territory must be accomplished at the expense of competition. Under some of the existing evils of the industry this means decrease in gross due to overallowance on the "trade-in" truck. And the decrease in available volume this year, compared with better years, has made competition generally more severe. Hence sales cost is much higher in proportion to dollar volume procured. To offset decreased volume, and decreased gross profits resulting from these over-allowances, drastic decreases have been effected in the salesman's compensation.

It is only common sense, of course, when a manufacturer experiences continued decreases in volume over a pro-

line, I cannot help but feel that our present basis of compensation is encouraging a poor class of business, and resulting in personnel problems for our field managers which is distressing, to say the least, under present uncertain conditions. It is placing an added burden upon their shoulders which is not conducive to the cooperation and coordination so highly essential at all times.

Underpaid salesmen are subject to worries. They worry about home finances, family living conditions, surplus cash for that "rainy day," payments of mortgages or instalments, etc., and in time they suffer from injured pride and then often loss of self-respect.

Those of us who have had a few

SPEAKING frankly, this business of paying salesmen good salaries and small commissions when business is *good*, and then reverting to very small salaries or straight commission when business is *poor*, I believe should be adjusted. It must be if we are to retain the real producers and constantly keep this business of selling trucks inviting to the best class of sales material available.

After all, the salesman is the keystone of the entire situation and if bad practices within our own industry are the real obstacles to reasonable profits let us not penalize the salesman to the point where we may greatly limit his efficiency.

Being in close touch with retail and wholesale problems right on the firing

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RATING FORMULA TELLS WHAT A TRUCK NEEDS FOR A GIVEN JOB

Any One of the Four Factors, Torque, Speed, Weight or Ratio, Can Be Calculated If the Other Three Are Known.

By JAMES W. COTTRELL

FORMULAS upon which the S.A.E. performance factor is based may be used for calculating problems encountered in applying trucks and trailers to specific jobs. The performance factor formula itself may be transposed to determine any one factor, the others being known. A study of how this formula was derived shows that it may be, in fact has been, transposed.

The starting point is the Buckendale formula presented to readers of COMMERCIAL CAR JOURNAL in the July, 1931, issue. A slight modification of the expressions by the rating committee and an assumption that rolling friction is 1.5 per cent changed the formula to:

$$\text{GVW or GTW} = \frac{T \times 12 \times e \times R}{r \left(\frac{G}{100} + RF \right)}$$

or, after multiplying,

$$\text{GVW} = \frac{675 D R}{r \left(\frac{100}{G} + 0.015 \right)}$$

Transposing terms to calculate grade, instead of gross weight, the formula becomes:

$$G = \frac{100 T \times 12 \times e \times R}{r \times \text{GVW}} - 100 RF$$

Substituting the figures agreed upon by the committee, that is, torque is equal to .625 times piston displacement and that mechanical efficiency is 90 per cent and multiplying the factors we have:

$$G = \frac{675 \times D \times R}{r \times \text{GVW}} - 1.5$$

This gives the grade directly in per cent, but does not give speed. The road-rolling resistance is shown by the final number 1.5. Putting rolling resistance and grade together on one side of the formula gives



$$\frac{675 \times D \times R}{r \times \text{GVW}} = G + 1.5$$

As previously explained in this series, speed is calculated by the formula:

$$\text{MPH} = \frac{\text{RPM} \times 60 \times 2 \pi r}{5280 \times 12 \times R}$$

$$\text{or MPH} = \frac{\text{RPM} \times r}{168 R}$$

Transposing these terms to bring gear reduction and rolling radius on the same side, opposite engine speed and vehicle speed, the equation is:

$$\frac{R}{r} = \frac{\text{RPM}}{168 \text{ MPH}}$$

Again substituting terms we have:

$$\frac{675 \times D \times \text{RPM}}{168 \text{ MPH} \times \text{GVW}} = G + 1.5$$

Two more mathematical acts will bring us to the performance factor formula. The first is to throw the speed factor on the right side of the formula and, figuring the factors with this in mind, we have:

$$\frac{4.01 \times D \times \text{RPM}}{\text{GVW}} = \text{MPH} \times (G + 1.5)$$

The right side of the equation combines speed, grade and rolling resistance and it is expressed as a single number, therefore is a numerical index of performance. By correcting for torque at maximum engine speed, instead of maximum torque irrespective of engine speed, the equation becomes

the performance factor formula given last month, that is:

$$PF = \frac{3.34 \times D \times RPM}{GVW}$$

These formulas may be used in two ways, first, to calculate the performance which may be expected of a given truck model, and, second, to figure the characteristics which must be incorporated in a truck to meet requirements of a given operation. The performance factor, which is included in the truck rating, can be applied by means of the table published last month without further calculations.

Use of the formulas may be illustrated by assuming a problem. The load to be carried is 6500 lb. and performance required is 30 m.p.h. and 4 per cent grade. A suitable chassis weighs 3500 lb., gross vehicle weight therefore is 10,000 lb. required; the piston displacement of engine and rear axle ratio to meet the conditions.

Looking up the performance factor table we find that 30 m.p.h. and 4.0 per cent grade calls for performance factor of 165. Without the table we can easily figure it because the performance factor equals miles per hour multiplied by grade plus 1.5. That is:

$$30 \times (4 + 1.5) = 165.$$

Let us assume that the engine in a truck we are considering is rated at 2500 r.p.m. How can we figure piston displacement? It can be calculated from the torque formula, but a simpler method is to use the performance factor formula. Substituting known figures in this formula we have:

$$165 = \frac{3.34 \times D \times 2500}{10,000}$$

Completing the calculation gives 197 cu. in. displacement. The engine of the imaginary chassis has 200 cu. in. displacement and therefore meets the requirements.

We have fixed both engine speed and vehicle speed in our calculations and therefore must use a rear axle ratio which will apply the engine torque to meet the speed and hill-climbing ability agreed upon.

There is a formula to give us engine speed when axle reduction, tire size and vehicle speed are known. It is:

$$RPM = \frac{MPH \times R \times 168}{r}$$

To calculate R directly the formula is transposed to put R, gear ratio, on the left, thus:

$$R = \frac{RPM \times r}{MPH \times 168}$$

Assuming that 32 x 6-in. tires are used the rolling radius will be 16.10 in. and substituting known figures in the formula including 30 m.p.h. we have:

$$R = \frac{2500 \times 16.1}{30 \times 168} = 7.9$$

This is the rear axle ratio which will provide 30 m.p.h. and hill-climbing ability of a 4 per cent grade with an engine of 200 cu. in. displacement. But the engine will be running at its recommended maximum speed of 2500 r.p.m. and in ordinary service operators do not wish to run an engine at full speed for a vehicle speed of only 30 m.p.h. If a maximum vehicle speed of 45 m.p.h. at maximum engine speed is satisfactory the gear ratio required will be 5.32. The figures are:

$$R = \frac{2500 \times 16.1}{45 \times 168} = 5.32$$

With this gear ratio in use the 4 per cent grade would be climbed with the transmission in gear, perhaps third speed in a four-speed gearset. Of course the figures vary with each job and those chosen for illustration are not of any particular truck model or operation. They are simply used as examples.

Rolling radius of tires is an essential factor in all of these performance formulas and it is one of the first figures to be determined. Just as soon as the vehicle gross weight of a truck recommended for a given operation is fixed, the very next step is to choose the tire size suitable for the load and operating conditions. When the tire is selected the rolling radius is taken from a table. Rolling radius is tied in with gear ratio because the radius determines how many revolutions the tire makes per mile. With a given radius of tire it is then the gear ratio which determines how many revolutions the engine makes for one revolution of the rear wheel and, therefore, how many revolutions the engine makes per mile.

Abbreviations used in formulas

GVW=Gross vehicle weight to nearest 100 lb. This weight includes chassis, body and payload and is measured at the tires on the ground.

GTW=Gross train weight in pounds. This weight includes chassis, body and payload of truck or tractor and trailers, measured at the tires on the ground.

D=Cubic inch displacement of engine.

T=Engine torque, in pounds-feet, available for vehicle propulsion. A recommended basis for purposes of comparison is 0.625 lb.-ft. torque per cubic inch displacement. This is an average value for average conditions and may vary slightly from actual torque developed. In the performance factor formula, due to the fact that the torque used is the torque at the maximum rated speed, an additional factor of .83 must be used so that the factor becomes .625 x .83 or .519. Therefore,

R=Axle gear reduction.

r=Rolling radius of loaded driving tires in inches.

RF=Road-rolling resistance factor in pounds per pound of GVW or GTW. A recommended basis for purposes of comparison is 0.015, an average value.

G=Grade in per cent.

e=Efficiency from engine to tires in direct drive. A recommended average is 0.90 in direct gear and 0.80 through transmission gears.

BHP=Brake horsepower available for propulsion of vehicle or train.

MPH=Vehicle speed in miles per hour.

RPM=Engine speed in revolutions per minute in direct gear.

PF=Performance factor.

The President's Page

CONTINUED FROM PAGE 9

of the motor vehicle, but the yield from motor vehicle revenues as well.

It is not the contention of the American Automobile Association that the railroads are not paying enough taxes. Every industry today is feeling the weight of the tax load, and the railroads are feeling it in common with others. Our contention merely is that highway transport is paying an enormous tax bill and that the propaganda of another transportation agency, namely, the railroads, encouraging a heavier tax on highway users, is indefensible.

The American Automobile Association has for years favored adequate regulation of highway common carriers by the states and, where interstate bus operations are involved, by the Federal Government. There is a great difference, however, between such regulation and the strangulation through the use of the taxing weapon which the railroads are encouraging throughout the country today.

The states have ample powers to make such regulations as would assure maximum safety for passenger cars using the highways along with heavy commercial vehicles. The question of length and width of these vehicles, including the truck and trailer combination, is certainly one deserving of study. However, it should not be approached in the punitive spirit that the railroads are fostering today.

It is to be hoped that the legislatures will insist on facts and not be led to hasty action by the shock battalions of railroad employees who have been so carefully coached that they speak the same lines with the same pathos and the same dramatic appeal at all the crossroads and way stations of America. They are careful not to point out that there are 50,000 communities in the United States that have no rail facilities and are wholly dependent on highway transport.

When it comes to the taxation of buses and trucks, the American Automobile Association, which primarily speaks for the passenger car owners, believe that commercial motor vehicles should pay a share of the road bill commensurate with their use of the road and the differential, if any, between the cost of arteries adequate for passenger car traffic and arteries necessary for heavy commercial traffic. This, however, is a matter for technical study. The commercial vehicle operators claim that they are now paying their share.

Pending definite conclusions based on expert studies, it is unscientific to resort to indiscriminate use of taxation as a means of bringing about the equality of opportunity on which the railroads lay so much stress and to which they are entitled.



Hydraulic-minded

THERE is a clearly defined group of people, owners and operators of automotive vehicles, who may fairly be called the "Hydraulic Market."

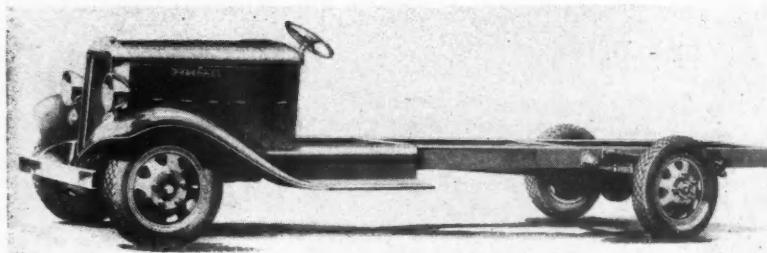
These numerous people have acquired, by personal experience, a conviction that Lockheed Hydraulic Brakes are the ultimate in brakes—as to actual stopping efficiency and as to satisfaction delivered.

They will always think so—as will a corresponding group of makers of cars, trucks, buses; who recognize the existence of that market; and see the economy of short-cutting the selling problem by giving these Hydraulic-minded customers what they want.

HYDRAULIC BRAKE COMPANY
DETROIT, MICHIGAN, U. S. A.

LOCKHEED HYDRAULIC *Four BRAKES Wheel*

FEDERAL CREATES A SMART STYLE FOR THREE NEW MODELS



Federal Model E-4, 1 1/2 Tonner

LONG straight hoods, with door type ventilating louvers, wide, deep, somewhat sloping and V-shaped radiator shells with grille type front, fenders with deeper crowns and appearing to be of one piece manufacture, splash pans which effectively conceal the front of the chassis—these details lend a distinctly modern appearance to three new models introduced by the Federal Motor Truck Co. for 1933.

These radiator shells are as deep as on any passenger car, with same pleasing effect, and the grille front conceals the fender and headlamp tie-bar in the modern manner. Mounted below each chrome-plated headlight is a diaphragm type horn. Hood louver doors have chrome-plated wind-splits.

For the cabs, there are three cowl ventilators, one on top and one on either side. Instrument panels are simple but attractive, and include a gas gage and temperature indicator in addition to the usual instruments.

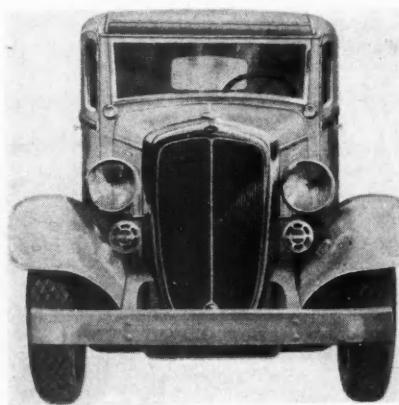
The three new Federal models are respectively, the E-4, a 1 1/2-ton chassis on wheelbases of 130, 142, 154, and 166 in., the A-7 with a rating of 2 1/2 to 3 tons and gross of 15,000 lbs., and the A-8 with a gross rating of 18,000 lbs. and tonnage capacity of 3-3 1/2 tons. The latter two are available in eight wheelbases each, ranging from 153 to 237 in.

While the A-7 and A-8 are completely new models, the E-4 is in some respects, mechanically a development from the former E-3 series. It is available with either the four or six-cylinder Continental engines found in the previous D-3 and E-3 models. Three point suspension, centrifugal water pump, oil filter and camshaft driven fuel pump are found on both engines. The six has Invar strut aluminum alloy pistons.

Standard tires on both models are 6.00/20 six-ply balloons front and 32 x 6 in. high pressure rears, all on ventilated disc wheels of the demountable type, with dual wheels available at extra cost. Other noteworthy features of the E-4 are an

11 in. heavy duty clutch, 4-speed transmission, full floating rear axle and 6 x 2 1/4 x 1/4 in. frame side rails. Standard chassis weight is 3225 lbs.

In the A-7 and A-8 the engines are Waukeshas, that on the smaller model being the 6MS series, with



Federal's snappy front end

the 6MK on the A-8. Both have a stroke of 4 1/4 in., with bores of 2 3/4 and 4 1/4 in. respectively. Built-in fly-ball type governors are found on these engines.

Clutches are single plate, with diameters respectively of 12 and 13 in. Mounted in unit with the engine is a five-speed Clark transmission on

both chassis. This transmission has helical constant mesh gears for countershaft drive and fourth speed operation, for quietness. Direct is in fifth. By the use of a five-speed transmission, of course, steps between gears have been materially reduced, while the dog-clutch shift between direct and fourth speeds facilitates handling by the operator for rapid shifting, when desired.

Both the A-7 and A-8 have Spicer universal joints with roller bearings of the needle type.

Four wheel hydraulic brakes with B-K vacuum booster brakes are found on the A-7 and A-8. Front drums are 16 x 2 1/2 in. Rear drums on the A-7 also are 16 in. with 3 1/2-in. lining, while 17 1/4 in. drums with 4-in. lining are found on the A-8. Emergency brakes are of the two-shoe ventilated disc type.

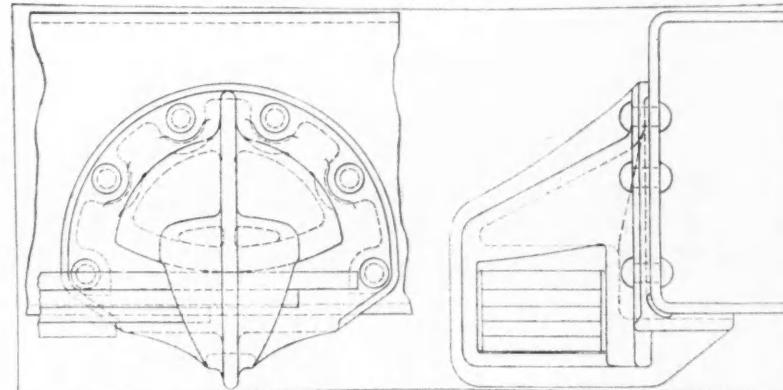
Rear axles on the A-7 are full floating spiral bevel Clarks with Timken on the A-8, also full floating. Front axles, of Clark manufacture on all models, are wider than on former Federal models, the increased tread being used for shorter turning radius.

Front springs are shackled at the front. Rear springs are also shackled at the front for Hotchkiss drive, but rear ends of these springs are of the floating contact type, eliminating shackles, pins or bushings, and need for lubrication. The top leaf of these chrome manganese springs contacts a radius in a frame bracket, and under load the effective length of the spring is shortened 2 in. from no-load to full-load condition.

Chassis frames are of the fish-belly type with 10 in. depth maximum section tapering toward front and rear. Side rail stock is 1/4 in. thick.

Tires on the A-7 are 8.25/20 in. balloons all around, mounted on 20 x 7 in. cast spoke type wheels. Wheels 20 x 8 in. of the same type carry the 9.00/20 in. balloons standard on the A-8.

Rear ends of rear spring slide



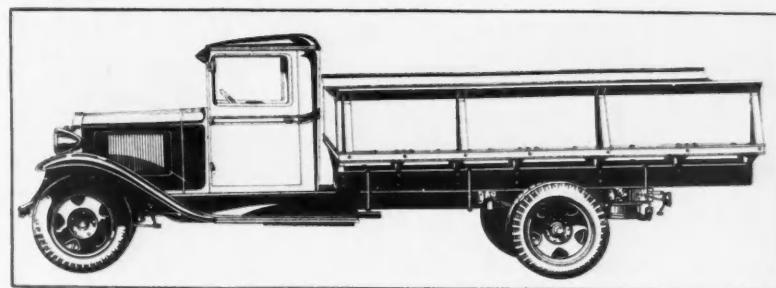
CHEVROLET JACKS UP POWER AND DROPS PRICE ON '33 LINE

FOR 1933 the Chevrolet commercial line consists of three models as formerly, a light delivery of 108 9/16-in. wheelbase, and the 131 and 157-in. wheelbase trucks, all at lower prices than last year. In the light delivery models axles, clutch, steering mechanism and wheels are interchangeable with passenger car units. Engines, however, are the same as those used in the heavy-duty trucks. Transmission in the light delivery is the same as in the passenger cars, including the synchro-mesh design, but omitting the free-wheeling unit. Sheet metal parts and radiator conform to those in the truck line. Frames are a modification of 1932 passenger frame.

The 131-in. wheelbase truck is supplied with either single or dual wheel equipment. It has a frame 6 1/2 in. deep, four-speed transmission, 10-in. clutch, heavy-duty front and rear axles, and a special truck engine. It is rated as formerly, 1 1/2 tons, having a gross allowable weight of 7500 lb. with single and 8300 lb. with duals.

The 157-in. wheelbase is rated at 7900 lb. gross with single and 8300 with dual wheels. Except for the frame it uses the same major units as the 137-in. model.

The engine which powers the entire Chevrolet commercial line incorporates all the developments which have been added to the 1933 passenger car engine. Horsepower output has been increased to 56 at 2750 r.p.m., with the increase relatively greater at low than high engine speeds; 51 hp. is developed at 2000 r.p.m., and torque peak in the relatively flat torque curve is 146 lb.-ft. at 1000 r.p.m. Engine mounting in the long and short truck line retains the metal supports at the rear, but at the front the spring mounting has been replaced by the same rubber unit now used on the light delivery.



Chevrolet 1 1/2-ton with express body

Prices of Chevrolet 1933 Line

	1/2 ton	1 1/2 ton	1 1/2 ton
Chassis	delivery	137 in.	157 in.
1933 ...	\$330	\$480	\$510
1932 ...	355	520	575

Delivery chassis wth bodies; sedan delivery \$545, standard panel \$530, special panel \$545, canopy \$525, screen side canopy \$544, closed cab pick up \$440, closed cab canopy top \$470.

Truck chassis 131 in. wheelbase with bodies; cab \$570, standard panel \$715, van panel \$870, canopy \$710, screen side canopy \$732, platform \$625, stake \$655, stake express \$665, open express \$650, high and wide express \$660, high rack \$670, special stake \$640.

Truck chassis 157 in. wheelbase with bodies; cab \$600, van panel \$950, platform \$670, stake \$715, stake express \$725, high and wide express \$705, high rack \$740, combination farm \$725.

Special equipment for 1 1/2 ton models, dual wheels \$25.

Racks for combination farm model \$60, tip top \$25.

Clutch and transmission improvements are minor in character. Universal joints, however, have been redesigned to provide greater strength and smoother operation. The joints on both lines of trucks are identical except for the square and splined holes to fit the various shafts to which they

assemble. The new joint is of the spider type with four cylindrical bearings. A flat machined on each of the trunnions provides for entrance of lubricant. Hardened steel bearings are assembled from the sides of the joint and retained by spring steel snap rings. These bearings are of the cylindrical type.

Fuel tanks, under the seat, have been increased to 15-gal. capacity. In both trucks the steering ratio has been increased to 14:1.

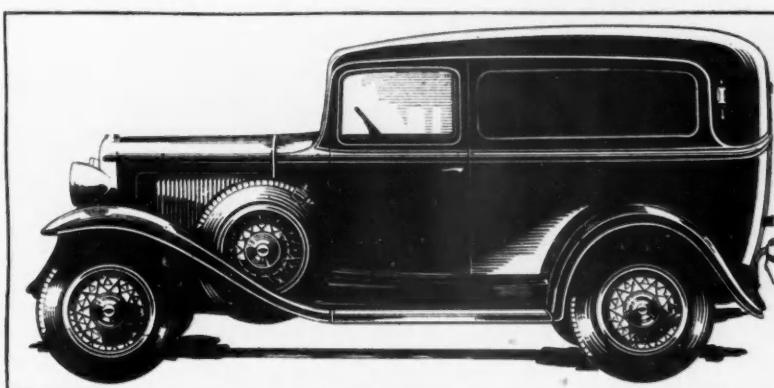
Frame section in the short wheelbase truck has been increased in all dimensions. Maximum depth is now 6 1/2 in., with 2 5/8-in. flanges, and using 3/16-in. stock.

Rounded edge leaves are found in the springs of the short wheelbase truck to decrease wear. On both Rear axles have been redesigned for greater strength, particularly at points of maximum stress. There is a new straddle mounted drive pinion. This involves a change in bearing sizes, the front pinion shaft bearing being larger and the rear smaller than formerly. Ring gears are larger in diameter. Differential is of the four-pinion type.

The torque tube is larger in diameter at the rear end, as is the propeller shaft. An optional axle ratio of 6.17:1 is available on the short wheelbase truck. Front brake drums have been increased in diameter to 12 in. as on the light delivery and passenger car, and provided with wider lining.

While standard wheel and tire equipment on the trucks remains unchanged, more options are available for varying conditions of service. All optional tires fit the 20 x 5-in. standard rims. Available at no additional cost are 6.00/20-in. 6-ply balloons. Available at extra cost are 32 x 6 8-ply tires, and 6.50/20 6-ply balloons, as well as 7.00/20 8-ply balloons. With the 6.50 and 7.00-in. balloons aspecial spacers are provided between the dual rear wheels to prevent side-wall rubbing.

Chevrolet delivery chassis with panel body



DODGE - SHULER - ROCKNE

Dodge Sedan Delivery Has Passenger Lines

CARRYING out the body lines of its new passenger cars in its new Sedan Delivery, Dodge Brothers has built striking appearance in this commercial chassis. It is mounted on the new Dodge Brothers six-cylinder chassis. Sloping V-shaped radiator front, with chrome-plated shell; fenders which conceal the chassis front and rear; chrome-plated windshield frames of the sloping type, with rounded front headers and hoods which extend almost to the base of the windshield, concealing the usual cowl, are among the appearance details of this new light delivery unit.

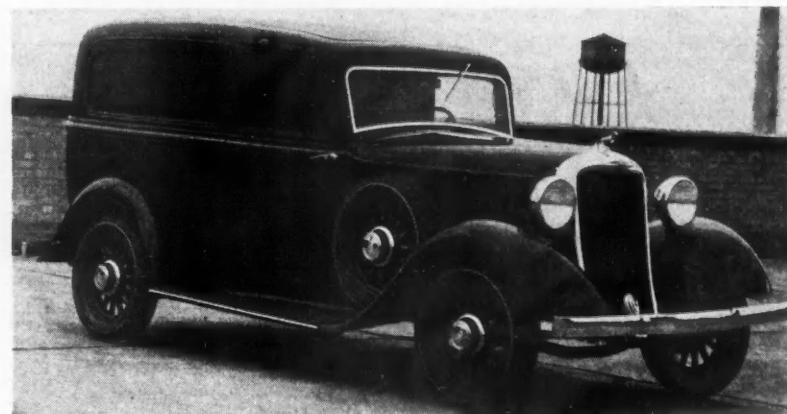
Cowls are stamped of a single piece of steel, making possible rigid and yet narrow posts for maximum vision for the driver. The dash is heavily ribbed and insulated against engine noises and heat. A hand operated cowl ventilator is located just back of the hood ledge. Door pillars are an integral part of the body sides, being flash-welded to the cowl and the rear end of the side panels. The one-piece steel body sides are placed over hardwood posts, lined with insulating material and covered with plywood to make them soundproof.

There are no separate roof side panels, these being formed integral with the body sides and curving gracefully over into the top. An inset panel, which adds to the attractiveness of the model, extends from front door to rear of body. Passenger car appearance characterizes the front doors, which are of all-steel construction with large windows hand-crank operated.

Easy access to the load compartment is achieved by use of a full size all-steel rear door. It is fitted with a large rectangular glass window. The roof is of the set-in type similar to that used on the latest Dodge passenger cars. The entire body, including the cowl, is rustproofed before lacquering by a special process known as Parkeliting, which also forms a bond for the primer paint coat.

Inside, a rubber matting, $\frac{1}{8}$ -in. thick, covers the entire heavy plywood

Shuler tubular axles are made from one-piece seamless tubing



Passenger car lines give new Dodge delivery unit striking appearance

floor. The floor itself is laid in one piece over cross sills, bolted to the bottom of the sides. Body interior, including the rear door, is finished in plywood veneered to a mahogany grained appearance. Loading space is illuminated by a dome light in the center of the body, which can be lit from two switches—one integral with the light, the other at the rear of the left door. The driver's seat has a steel frame with Pullman type springs, heavily padded and is adjustable. A folding companion seat is provided to the right, hinged to the floor. Front compartment doors under the rubber matting are heavily padded for heat and noise insulation.

Steering columns have been made adjustable. Brake and gear shift levers are placed well forward to provide easy access to the seat from either side. Rubber pads are provided on the pedals as well as the accelerator and starter. Instruments are carried in an attractive and indirectly illuminated panel.

ed to meet the demand for this type of design.

The tubular axle is made from one piece seamless tubing, the spindle ends being formed in the rolling operation. Tubes are heat-treated and can be furnished with or without camber as specified. The entire assembly is free from welds. Hubs and brake equipment are interchangeable with similar parts on regular axle equipment.

Delivery Unit of New Rockne Lists at \$615

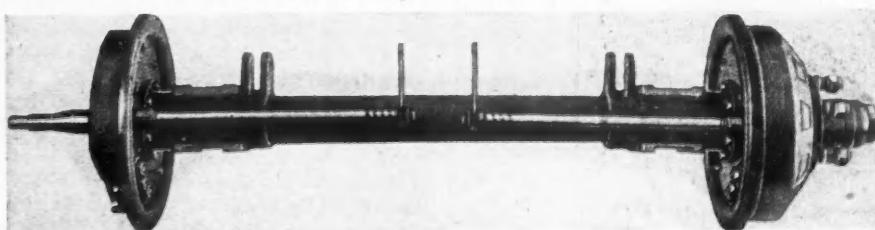
SHOW time announcements by Studebaker include a new name in the commercial field, the new Rockne retail delivery unit, a de luxe style panel job, listing at \$615. The engine is a six $3\frac{1}{2} \times 4\frac{1}{2}$ in., of 190-in. displacement. A distinctive feature of the body is a two-level roof, the roof of the loading compartment being higher than that over the driver's space. Complete description of the unit will be available within the near future.

Truck Legislation Shoots Up Cost of Feeding the Public

CONTINUED FROM PAGE 17

four cents per cwt. additional cost to our transportation bill.

There is a place for all forms of transportation in a distribution system such as ours. The imposing of restrictive legislation on motor trucks will increase our cost of distribution. Some form of regulation is necessary, but it must be fair and based on scientific information. It must be uniform in all states to permit free and easy flow of trade. Restrictive legislation will not prevent the most economical form of transportation from being used for each distribution problem.



"Money players..."

TIMKEN **TUBULAR TRAILER AXLES**

Like the ball-player and football star that outdo themselves in crises Timken Trailer Axles prove their extra worth when you figure actual dollars and cents, in costs and profits.

The tubular section of the Timken Trailer Axle—

- * reduces chassis weight, without sacrificing carrying capacity.
- * weighs much less than any solid beam of equal capacity.
- * resists deflection under radial or torsional loads.

What's the answer? Timken Trailer

Axes minimize tire wear; solve the trailer-brake problem; cut operating costs.

These are facts, easily provable. The best way is prove them for yourself: to *your own profit*.

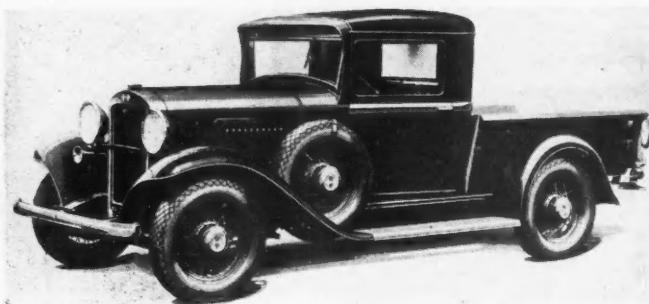
On new trailers, specify Timken Tubulars. To modernize brakeless trailers, and to correct excessive tire wear, equip with Timken Tubulars.

Interesting booklets covering all phases of vital trailer-operation problem will be sent to you on request.

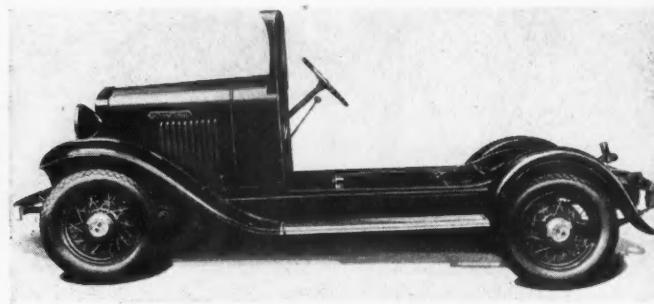


THE TIMKEN-DETROIT AXLE COMPANY, DETROIT, MICHIGAN





Cab and pick-up body on Model D-1



Chassis includes cowl and windshield support

I. H. C. CRASHES LIGHT DELIVERY FIELD WITH \$360 HALF-TONNER

STARTING of production of the new International Model D-1 a $\frac{1}{2}$ -ton six-cylinder truck marks the entrance of the company into the light delivery field and in the highly competitive low-price bracket. The chassis with standard equipment lists at \$360, which is the lowest price ever quoted on an International chassis, and is but \$30 more than the 1933 Chevrolet and \$40 more than the Ford delivery chassis.

Model D-1 is being built by the Willys-Overland Co. to International Harvester Co. specifications. First units came off the assembly line late in December, and first schedules call for production of 100 units daily, according to L. A. Miller, president of Willys-Overland.

The chassis is rated to carry $\frac{1}{2}$ -ton, and chassis carrying capacity, comprising cab, body, equipment and payload, is specified at 2000 lb. The unit is powered by a six-cylinder $3\frac{5}{16} \times 4\frac{1}{8}$ in. engine with 213 cu. in. displacement. A 9-in. single plate clutch, three-speed unit mounted transmission, and spiral bevel gear semi-floating rear axle make up the drive line. Five 40-spoke 18-in. wire wheels and left front fender well and tire carrier are standard equipment. Coupe type cab and pick-up body or de luxe panel body are available at extra cost.

Brake horsepower of the engine is 70 at 3400 r.p.m., and maximum torque of 138-lb. ft. is developed at 1200 r.p.m. The crankshaft is carried in four steel-backed interchangeable type main bearings. Tool seat valve inserts are used for the exhaust valves. Lubrication is force feed to main, connecting rod and camshaft bearings and timing chain. The downdraft carburetor is fitted with an air cleaner.

Service brakes are of 4-wheel two-shoe self-energizing type controlled by cable. Hand lever likewise applies

Specifications of Model D-1

Rated capacity	$\frac{1}{2}$ -ton
Price	\$360
Engine	6 cyl.
Cylinders	$3\frac{5}{16} \times 4\frac{1}{8}$ in.
Displacement	213 cu. in.
NACC rating	26.3 hp.
Brake hp.	70 @ 3400 r.p.m.
Torque	138 lb.-ft. @ 1200
Clutch	9 in. single plate
Transmission	3 speeds
Rear axle	Bevel-semi-float.
Brakes	4-wheel mech.
Tires	5.25/18 balloon
Wheels	Five, wire type
Bodies	Cab, pick-up, de luxe panel

brakes on four wheels. Tires are 5.25/18 balloons on both front and rear wheels.

The frame includes a double drop, and is 43 $\frac{1}{4}$ in. wide at the rear. Channels are 5 $\frac{1}{4}$ x 2 $\frac{1}{4}$ x 9/64 in. and

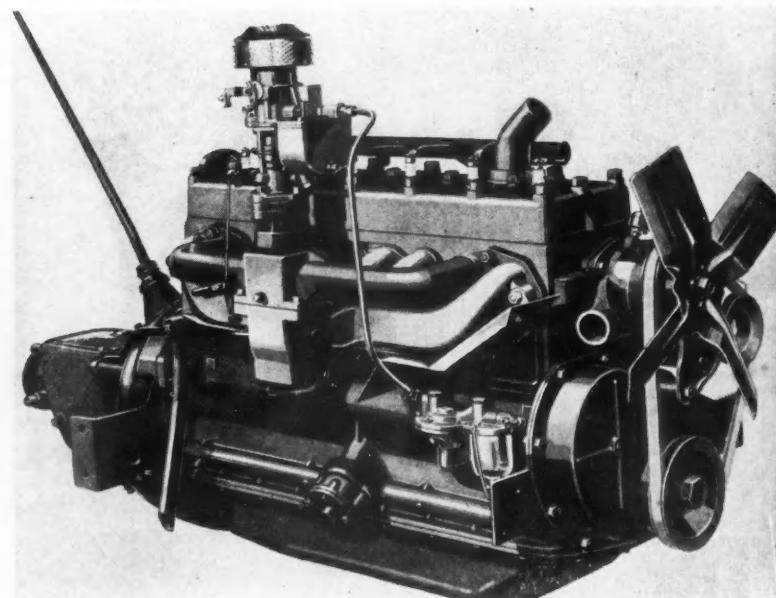
are joined by five cross-members.

The pick-up body, of all-steel construction, has loading space 66 x 46 $\frac{1}{4}$ in., with side panels 11 in. high with 6-in. flareboards. The body has four stake pockets, and the end gate chains are covered.

Load space dimensions of the de luxe panel body measure 72 in. long, 46 $\frac{1}{4}$ in. wide and 47 in. high. It has full panels of three-ply fir veneer in natural finish. There is a single adjustable seat. Slanting windshield, rear vision mirror and dome light are included.

Standard equipment includes cowl, dash and windshield supports, front and rear fenders, running boards and the usual instruments. Special equipment at additional cost includes: front bumper, two-way shock absorbers, and the cab and bodies previously mentioned.

The D-1 engine is a $3\frac{5}{16} \times 4\frac{1}{8}$ in. six





COMMERCIAL CAR JOURNAL

NEWS

Highway Interests Mobilize

More than twenty-three leading national organizations interested in highway and building activities have joined forces in the Highway and Building Congress to be held at Detroit during the week of January 16, 1933. Plans will be made to forestall drastic curtailment of highway development and motor transportation growth threatened by proposals to divert motor vehicle and gasoline tax revenues to purposes other than highway construction and maintenance. The highway sessions of the Congress will be held at the Masonic Temple, January 19 and the building sessions

TURN TO PAGE 58, PLEASE

Tax Exemption Rulings

Several important rulings have recently been announced by the Tax Department with respect to the tax on automobile parts and accessories. For example, wrecking cranes sold for mounting on trucks, towing cradles used in connection with service trucks, reboring machines, valve refacing machines, valve regrinders, air compressors and paint spraying equipment are not considered as parts or accessories and are not subject to tax.

Lee Tops A. B. L. A.

Robert Lee, vice-president, Thermoid Rubber Co., was elected president of the Asbestos Brake Lining Association. G. W. Marshall, Jr., assistant sales manager, U. S. Asbestos, was elected first vice-president; M. T. Rogers, vice-president, Multibestos Co., second vice-president; and W. J. Parker, commissioner.

Lycoming V-12 Truck Engine

The Lycoming Mfg. Co. exhibited at the New York Show its new V-type, 12-cylinder truck engine. It has a 3½-in. bore and 4¼-in. stroke giving a displacement of 492 cu. in. and developing 160 hp. at governed speed of 2800 r.p.m. with torque of 350 lb. ft. at 1200 r.p.m.

Handy Governor Manual

Handy Governor Corp. has issued a new manual of governor specifications covering the entire field of truck transportation which is available to any fleet owner, truck dealer or service organization.

Cleveland's Truck Trio

Manufacturing, engineering and sales departments of the Indiana Motors Corp. will remove from Marion, Ind., to Cleveland, Ohio, immediately, accordingly to A. E. Bean, president, White Motor Company. This brings

to the White factory the manufacture and assembly of White, Pierce-Arrow and Indiana truck lines. The removal of the Pierce-Arrow truck line from Buffalo, N. Y., to Cleveland is now practically complete. Studebaker trucks will continue to be built at South Bend and Rockne commercial cars at Detroit.

Doling Heads N. Y. Autocar

Chas. E. Doling, a vice-president of the Autocar Sales & Service Co., has been transferred as manager from the Philadelphia branch to the Metropolitan New York area. Auto-car executives felt that the increasing volume of business from this section warranted this transfer of one of its most capable men. Edward F. Coogan, also a vice-president of the subsidiary unit of the Autocar Company, leaves Boston to take Mr. Doling's place in Philadelphia. H. R. Gary has been elected a vice-president and transferred to the Boston branch management, succeeding Mr. Coogan.

Depression Takes an Upper-cut

November sales of the Diamond T Motor Car Co. showed a gain of more than thirty per cent for the corresponding month of 1931. In fact, more trucks were sold in November, 1932, than in any previous November in the 25-year history of the company.

November Truck Sales

November sales of trucks made in the United States, according to the Bureau of Census, were 12,024 compared with 13,595 in October; 19,683 in November, 1931, and 35,613 in 1930.

Preliminary 1932 Truck Facts

During 1932 237,500 trucks having a wholesale valuation of \$138,000,000 were produced in the United States and Canada, according to preliminary facts and figures released by the National Automobile Chamber of Commerce. The truck registration was 3,231,000 of which 880,000 were on farms. Of the total trucks registered

TURN TO PAGE 58, PLEASE

These Men Want Jobs

Osborn, John D. (39), 91 Linden Avenue, Irvington, N. J. Nineteen years' experience in trucking and express work. Thoroughly familiar with New Jersey and New York City. Was sheet writer, chauffeur and foreman with one concern for 17 years and another for two. Desires any position in line with experience. Will go anywhere.

A-14 (40), 23 years' automotive experience. Grounded in modern methods of budgetary control, market research and sales analysis. Knows branch, distributor and dealer method. Able to train men, conduct service sales meetings, line up service sales territories, promote service sales contests. Traveled extensively in eastern territory. Available now. Location immaterial.

N. Y. Truck Groups Combine

More than 2000 individuals and companies operating commercial vehicles in New York State have been brought together in a single organization through the amalgamation of the Motor Truck Association of America and the Empire State Motor Truck Owners Association. The combined group will be known as the New York State Motor Truck Association, Inc., with headquarters at 1440 Broadway, New York and 184 State Street, Albany. Henry V. Mittleworth of the Consolidated Gas Company has been elected president. The executive department will be under the direction of Theodore D. Pratt, managing director, and Louis G. Stapley, manager.

Frank A. Miller With U. S. Asbestos

To more fully capitalize the potentialities of the commercial transportation field the United States Asbestos Division of Raybestos-Manhattan, Inc., has formed a Commercial Transportation Sales Division. Its manager is Frank A. Miller, formerly with the Stromberg Carburetor Co. in a sales and advertising capacity, and later

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Jersey Direction Indicators Enjoined

An order restraining Harold G. Hoffman, Commissioner of Motor Vehicles of New Jersey, from enforcing the law requiring trucks and cars to have direction indicating signal devices has been issued. Indications are that the state will repeal the act.

Kentucky Truck Law Upheld

Kentucky regulatory truck law which fixes maximum load at 18,000 lb., height 11½ ft., width 9 in., and length 26½ ft. has been upheld by the State Court of Appeals as constitutional.

Dahl an N. A. C. C. Director

T. R. Dahl, vice-president, White Motor Co., has been elected a director of the N.A.C.C. Mr. Dahl is also a member of the Chamber's Truck Committee.

White Has Good Month

More White trucks were sold during December than in any month since last June, according to an announcement made by J. M. Cleary, president of the White Company.

Puts on 13,734 Workers

General Motors Corp. announce that 13,734 employees have been placed on the payroll in the past three months.

Is the Salesman's Purse In Need of Adjustment?

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longed period that sales organizations will be reduced in size and compensation reduced somewhat, but I believe you will agree that the salesman is not altogether responsible for the loss in volume, and it would of course be unfair to blame him for an accepted evil like "over-allowance." Hence in the face of these existing conditions, I believe the salesman has received more than his rightful share of "salary cutting." In fact, I believe the cuts have been too drastic, and that they are creating a rather destructive effect upon the morale of our men in the field. It is, therefore, vitally important that the industry formulate a plan of compensation for salesmen and sales managers that is more commensurate with the experience and ability necessary for sales success in an unusual and highly competitive field.

The straight commission basis, which is meeting with favorable consideration by many factory executives and a few branch managers, is not the solution to our sales problem under present conditions by a wide margin. There are too many factors working against it, and the time between orders is too great.

The commission form of compensation originated with companies merchandising products that enjoyed a brisk turnover, when demand slightly exceeded production, and when prices and terms were highly stabilized. Straight commission salesmen even in those days would lag several days after a good profitable sale, a very dangerous habit for a salesman to form but one nevertheless difficult to control. Then, too, companies working on straight commission basis frequently have to advance money to their salesmen at time during business recession, often resulting disastrously for many good men who find themselves in debt up to their neck to the concern they work for. Again we frequently experience another bad reaction to sales psychology when these advances are deducted from commission earned and the adjustment is not handled diplomatically. The straight commission salesman may feel that he is his own boss and therefore frequently he is not receptive to constructive advice or may not carry out certain instructions which may be highly important to the company because he feels he is not being paid for it. In other words, sales direction is considerably limited.

The salesman working on a straight salary on the other hand may not strive to produce more than he is being paid for, and the really ambitious salesman highly resents the fact he cannot earn more for doing the exceptional job over a long period of time, which soon dull enthusiasm and initiative. Then there is always the

danger with the "straight salary" man to direct his thoughts and actions toward justifying his salary only, thereby limiting his capacity to the amount of his salary.

I have heard some tight-fisted executives say that only salesmen who pay their way should be paid. And I agree, but how much should the salesman be paid? It has also been rightfully said that the earning power of the salesman is unlimited if he can sell, which is quite true. But on the other hand, what are the average monthly earnings per salesman in any given truck organization today?

Regardless of some opinions to the contrary, we must, I feel sure, offer sufficient incentive to our salesmen to insure consistent hard effort. I believe the combination of salary and commission comes very close to the ideal method of compensation, but the salary should be sufficient to meet the ordinary necessities of life, and commissions of fair percentage that offer the chances of real income to the salesman procuring satisfactory volume. In other words, the opportunity of commission earnings should be sufficient to insure the better than average salesman, to have money in the bank, investments in securities, protection against emergencies, slumps and incapacities. This form of compensation encourages extra effort, longer hours and stimulates resourcefulness. It forms the added incentive to make that extra call or two, which means more business.

The rate of commission to be paid, of course, depends largely upon gross profit possibilities together with the amount of salary paid per month. Commissions should be based on a sliding scale according to the quality of the order, encouraging substantial cash down payments and limited terms, as much as possible, keeping in mind however that in the majority of cases the salesman has not a very strong control of this situation, that is above averages.

I do not know of any sales job today requiring the varied knowledge and experience necessary in successful truck selling, in fact aside from being a salesman in every sense of the word, he must know his own product thoroughly and his competitors' products as well. He must be a well posted transportation man with a viewpoint from the operator's side. He should be fairly well grounded in mechanics generally and have a thorough understanding concerning general chassis design, load balance, truck ability, tires and tire capacities, brakes and braking ability, cab and body construction, refrigeration, dumping mechanism, winch and capstan performance, gear ratios and its relations, together with a good knowledge of operating and maintenance costs. In fact, the industry is becoming more exacting every day in its demands upon "selling ability" and "knowledge of truck transportation" and all of its ramifications.

Therefore, I believe you will agree with me that this business of merchandising motor trucks has indeed become a highly specialized sales job requiring the best ability we can procure and that the importance of fairly compensating these demands is quite evident.

A good salesman is never a liability and the sales job we have ahead of us right now requires real man-power.

To a great extent in the eyes of the buyer a company is no bigger than the salesman representing it, and to insure proper representation compensation must be liberal enough to offer real opportunities.

N.Y.C. Shop Sweeps Out Wasteful Repair Practices

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engine mounting bolts ordinarily extend. Distance from center to center of posts is 30% in.

Fig. 39—Rear Axle Thread Chaser

Broken or crossed threads on rear axle tubes are cleaned up by a cylindrical type thread chaser. It comprises a relatively long cylinder with two handles, removable like those in a thread die. The thread cutter is inserted in a slot near the top and fastened by a small cross clamp.

Fig. 40—Wiper Rings

A stepped ring holder is used to support piston rings while a cut is made in the bottom edge to provide a wiping action to control oil pumping. After the ring is in place, it is held in position by the removable cover.

Fig. 41—Wheel Puller

A heavy duty wheel puller has threads which engage six wheel studs instead of the hub thread. This puller will remove wheels which will not respond to ordinary pullers and its use prevents damage to hub threads.

Fig. 42—Clutch Drive Flange

A loose center section features this clutch drive flange puller. After it is fastened in place and pressure applied, a limited amount of movement of the threaded center section can take place within the steel plate. This imposes a severe shock on the shaft during hammering and loosens the flange.

Fig. 43—Crankshaft Gear Puller

A heavy duty type crankshaft gear puller is used to remove the combined starting crank dog and crankshaft gear on certain engines. It is powerful enough to shear the pin which prevents the gear from moving lengthwise of the shaft. Drilling the pin out, which is the usual procedure, sometimes takes as much as two hours.

Fig. 44—Universal Joint Flange Puller

A discarded flange forms this flange puller. Pressure screw and a bushing through which it passes are the only added parts.

Millions for Truck Industry Seen When Beer Flows Again

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the coming of real beer will come an immediate growth in breweries.

Back in 1914 when the brewing vocation was considered an eight-billion-dollar industry, there were 1392 breweries in operation. This is the figure ascribed to Professor Herman Feldman of Dartmouth, who is himself a prohibitionist. These breweries supplied the peak consumption of 66,000,000 bbl. of beer in 1914.

John F. Hunt, president of a brewery machinery firm, has declared that there will be 2000 breweries established in the first year of legalized beer.

Perhaps Mr. Hunt is a bit optimistic, because the maximum estimate of anticipated consumption made for taxation purposes stopped at 60,000,000 bbl. Certainly 2000 breweries will not be needed to supply 60,000,000 bbl. if 1392 supplied 66,000,000 bbl. in 1914. And yet it may be that Mr. Hunt allows for the mushroom growth which every industry undergoes when its product gains recognition.

If Mr. Hunt is correct the 2000 additional breweries should, on the basis of most conservative estimates, mean an additional \$30,000,000 in new truck sales. This estimate is the result of figuring five trucks per brewery at the average cost of \$3,000 per truck. This average cost comes from the survey of existing brewers. The figure of five trucks per brewery does not. It is simply picked as an ultra-conservative estimate. The existing breweries average 40 trucks per brewery. But since most of the new breweries will spring up in smaller localities it is practically certain that neither the consumption nor distributing area would require many more trucks than five per brewery.

If you believe Mr. Hunt is over-optimistic perhaps you would like to base your estimate of the potential new truck market on the number of breweries which in 1917 turned out the number of barrels which the experts believe will be consumed when beer comes back? This was accomplished, you remember, by 1392 breweries. Hence you could expect approximately 1200 new breweries to spring up. On this basis, and using the same averages as above, the additional new-truck potential would be 6000 units at a cost of \$18,000,000.

So, considering all these "ifs"—and in the circumstances, there is nothing else you can consider—the truck industry within a year after legalization of beer may sell to the brewing vocation any where from 11,000 to 15,000 new trucks at a cost of from \$32,000,000 to \$44,000,000.

And here again—to figure the benefits to the truck industry as a whole, one must not overlook the benefits that will accrue to the allied branches of the truck industry. The survey presented in tabular form tells the

story for the existing breweries but it would be taxing credulity even more than (it is to be feared) has already been done to attempt to compute estimates for the industry as a whole.

Moreover, this discussion has dealt solely with what beer may bring to the truck industry from the brewing vocation. To approximate the full effect of beer legalization on the truck industry, it is necessary to consider its effect on every branch of the brewing industry.

Cooperage—Which expects to supply 12,000,000 barrels.

Glass—Whose representatives say 864,000,000 bottles would be required, and say nothing about schooners, mugs, shell-glasses and such-like.

Wooden Boxes—Anticipating \$40,000,000 worth of business annually.

Agriculture—Hops and barley growers expect to flourish.

How many new trucks these industries will purchase to replace outworn equipment and to take care of expanded business is a difficult problem to answer but every purchase will certainly contribute to a revival of our own truck industry.

Heavy Gas Taxes Crush Gas and Vehicle Sales

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Columbia having a 2-cent tax. In the others it fell off in just about the inverse ratio to the increase of the tax. (See tabulated figures.)

In the face of such conditions, it is inevitable that the motor manufacturing industry should have touched its low ebb during this year. Excessive taxes meant fewer cars built; less demand for iron, steel, glass, leather, everything that goes into a car. It has meant less business for the railroads; less of about everything, except unemployment.

It seems strange that the automotive and petroleum industries, which are pretty nearly Siamese twins in the business world, should be so persistently singled out as victims of discrimination. Many economists firmly believe that the development of these two industries, along with the construction of our great national system of improved highways, more than anything else was responsible for the country's astonishing prosperity in the last decade. Yet apparently public policy, manifesting itself through the national congress and the state legislatures, seems bent on punishing these industries. Having got gasoline taxes jacked up to the point of extortion, we now confront the fact that 44 state legislatures, meeting this winter, are being put under pressure to legislate against the automotive and oil industries, and against the open highway. It has been dinned into the country's ears that the competition of trucks on the highway is chiefly responsible for the unfortunate financial plight of the railroads. Of course, the railroads are having a bad

time because all business is having a bad time. Railroad volume is nowadays accepted as about the best gage of business conditions; but it would be just as sensible to blame the thermometer when your room got cold, as to give car loadings either credit or blame for business conditions.

However, the railroads' propaganda has about convinced a good many people that the thermometer instead of the furnace is what keeps the house warm. If the railroads have their way a number of states will pass laws this winter severely restricting commercial vehicles on the highways, on the theory that it will somehow help the railroads. Now, the modern highway and the commercial vehicles operating on it have been the best friends and the greatest traffic producers for the railroads. Consider that from 1915 to 1929 the very period in which the trucking industry was built up, the freight revenues of railroads actually increased 140 per cent—from 2126 millions to 4899 millions of dollars. How many other businesses did as well as that?

The truth is that the growth of trucking service in that very period, making it easier and cheaper to bring freight to the rails and to distribute it from them, was one of the important factors in making the railroads so prosperous. The automotive and petroleum industries furnish about 12.6 per cent of all carload freight moved by rail; the outside calculation of freight they take away from the rails is 5 per cent. President Loree of the Delaware & Hudson Railroad declared that the truck tonnage was "so insignificant as to make any effort toward their control by rate regulation scarcely worth while." Daniel Willard, of the Baltimore and Ohio, frankly said concerning the railroads' troubles that "the main cause is the business depression."

But while the more liberal and intelligent railroad leadership recognizes these things, the anti-truck propaganda has been pounding away on its tom-tom until it has become almost impossible for the country to hear the arguments of reason.

Every passenger car operator naturally dislikes the truck; too few of them realize that 9 per cent of all the trucks are carrying the necessities of life to their homes and to the homes of other passenger car operators similarly situated. The truck and its service have become absolutely essential in our present-day mode of living. Nevertheless, there will probably be a considerable amount of legislation this winter designed to ham-string the trucks and suppress highway "competition."

I would like to register right now the carefully considered prediction that legislatures which allow themselves to be stampeded into passing such measures will do their states, and also the railroads, positive harm.

You can't make the clock run backward.

COMMERCIAL CAR JOURNAL'S

CORRECTIONS ARE MADE EACH MONTH FROM DATA SUPPLIED DIRECT BY TRUCK MAKERS +

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS						FRAME					
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Front	Rear	Make and Model	No. of Cylinders	Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	Gear and Type	Drive and Torque	Gear Ratios		
																In High	In Low		
1	A.C.F.	160	6	6950	186	222	26000	10170	B9.75/22	B9.75/22	Has 160	6-4½x5½	BL 1714	U 4 Op Tim 76730	2F	R 7.46 52	8x3	P	
2		175B	6½	8300	186	222	26000	10750	B10.50/22	B10.50/22	Has 175	6-5x5	BL 714	U 4 Op Tim 76730	2F	R 7.46 38	8x3	P	
3	(All 4 Wh. Dr.)	175A	7½	8800	186	240	30000	11610	B10.50/24	B10.50/24	Has 175	6-5x5	BL 714	U 4 Op Tim 79730	2F	R 7.48 38	8x3	T	
4	Armeleder	11Ha	2-3	1570	156	195	11500	4070	B7.00/20	DB7.00/20	Con 16C	6-3½x4½	Fu WOBB	U 4 No Tim	BF	H 5.83 31	2x6x3½	P	
5		21Ha	2½-4	2185	160	207	15300	4783	B8.25/20	B8.25/20	Her WXB	6-3½x4½	Fu MLU	U 4 No Tim	BF	H 6.06 38	5x3x3½	P	
6		31Ha	3½-5	2745	146	213	19500	5838	B9.00/20	B9.00/20	Her WXC	6-4x4½	Fu MGU	U 4 No Tim	BF	H 6.02 39	7x3x3½	P	
7		41Ha	4½-6	3050	160	227	23000	6600	B9.75/20	B9.75/20	Her WXC	6-4x4½	Fu MGU	U 4 No Tim	BF	H 6.83 43	8x3x3½	P	
8		61Ha	5-7	3625	146	227	24000	7400	B9.75/20	B9.75/20	Her WCX	6-4½x4½	Fu VUOG	U 5 No Tim	WF	R 8.5 55	2x8½x3x½	P	
9		71Ha	7-9	4595	164	235	29500	7800	B10.50/20	DB10.50/20	Her YNC	6-4½x4½	Fu VUOG	U 5 No Tim	WF	R 8.5 55	2x8½x3x½	P	
10	TRHA	10	3645	148	174	35000	6250	B9.75/20	B9.75/20	Her YNC	6-4½x4½	Fu VUOG	U 5 No Tim	BF	R 7.8 55	1x7x3x½	P		
11	TRDA	10	3895	148	174	39000	6450	B9.75/20	B9.75/20	Her YNC	6-4½x4½	Fu VUOG	U 5 No Tim	2F	R 7.8 56	8x3x3½	T		
12	Atterbury	A	1	1095	132	145	7000	3400	P30x5	P30x5	Lye WTG	6-3x4½	Wa T9	U 4 No Tim	51000H	BF	H 6.20 39	7x5¾x3¾x14	N
13		K 1½	1595	145	160	8000	3640	P32x6	P32x6	Lye WTG	6-3x4½	Wa T9	U 4 No Tim	52000H	BF	H 6.50 39	5x3x3½x14	N	
14		G 2	1985	160	160	10000	3955	P32x6	P32x6	Lye 4SL	6-3½x4½	Co F4B	U 4 No Tim	54200H	BF	H 6.80 45	1x5¾x3½x14	C	
15		45-2½	2375	173	188	12000	5300	B7.50/20	DB7.50/20	Lye ASD	6-3½x4½	Co W4C	U 4 No Tim	56200H	BF	H 6.80 39	7x3x3½	C	
16		50 2½-3	2950	189	202	14000	5800	B8.25/20	DB8.25/20	Lye ASD	6-3½x4½	Co W4C	U 4 No Tim	58200H	BF	H 7.40 43	3x7x3x½	C	
17		R 3	1700	173	199	16040	7250	P34x7	P34x7	Con 18R	6-4x4½	BL 35-4	U 4 No Tim	60501H	WF	H 7.1 37	4x7x3x½	C	
18		60 3	3150	190	215	16000	6900	B9.00/20	DB9.00/20	Lye ASD	6-3½x4½	Co W4C	U 4 No Tim	65200H	WF	H 7.80 45	6x3x3½	C	
19		65-3½-4	4050	209	221	18500	7800	B9.00/20	DB9.00/20	Con 18R	6-4x4½	BL 51-5	U 4 No Tim	65200H	WF	H 7.50 40	1x8x3x½	C	
20		70 3½-4	41 0	222	222	23000	8400	B9.75/20	DB9.75/20	Con 20R	6-4½x4½	BL 51-5	U 4 No Tim	66720D	WF	R 8.50 62	9x3x3½	C	
21		C 3½-4	4750	186	220	19315	8300	B36x8	DP36x8	Con 20R	6-4½x4½	BL 51-5	U 4 No Tim	67607D	WF	R 9.0 85	5x3x3½	C	
22		100 5-6	5675	223	237	28000	9100	B10.50/20	DB10.50/20	Con 21R	6-4½x4½	BL 55-7	A 7	51000H	SF	H 5.22 33	5x6x3½	T	
23	Autocar	B 1½	2250	159	189	5370	B7.00/20	DB7.00/20	Own R	6-3½x4½	BL 234	U 4 No Own A	52000H	SF	H 8.57 54	3x7x3x½	T		
24		RF 2	2450	159	189	5750	B8.25/20	DB8.25/20	Own R	6-3½x4½	Own T	U 4 No Own A	54200H	SF	H 8.57 54	3x7x3x½	T		
25		RG 2½	2600	159	210	5975	P34x7	P34x7	Own R	6-3½x4½	Own T	U 4 No Own D	56200H	SF	H 6.21 39	3x8x3½	T		
26		A 2½-3	3000	150	192	6350	B8.25/20	DB8.25/20	Own SD	6-4x4½	Own T	U 4 No Own A	58200H	SF	H 8.22 33	3x8x3½	T		
27		D 3	3500	150	192	6375	P34x7	P34x7	Own SD	6-4x4½	Own T	U 4 No Own D	60200H	SF	H 6.21 39	3x8x3½	T		
28		DE 3½	3850	150	210	7000	B9.00/20	DB9.00/20	Own SD	6-4x4½	Own T	U 4 No Own TE	6200H	SF	H 6.43 40	7x8x3½	T		
29		DF 3½	3950	150	192	7075	B9.00/20	DB9.00/20	Own SD	6-4x4½	BL 51-5	U 4 No Tim	66720D	WF	R 8.52 54	6x9x3½	T		
30	(Eng. und seat)	HS 3½	4600	114	161	7900	P40x8	DP40x8	Own M	4-4½x5½	Wa T9	U 4 No Tim	67607D	WF	R 8.57 54	3x7x3x½	T		
31		SHS 3½	4800	114	161	7900	P40x8	DP40x8	Own SCH	6-4½x4½	Wa T9	U 4 No Tim	68720	WF	H 9.92 121	10½x12½x3½	T		
32		DH 4	4150	150	174	7250	P36x8	DP36x8	Own SD	6-4x4½	Wa T9	U 4 No Tim	68720	WF	H 9.92 121	10½x12½x3½	T		
33		N 4	4600	191	227	8090	B9.75/20	DB9.75/20	Own SCH	6-4½x4½	Wa T9	U 4 No Tim	70731	WF	H 8.57 54	3x8x3½	T		
34		NE 5	4725	149	170	8300	B9.75/22	DB9.75/22	Own SCH	6-4½x4½	Wa T9	U 4 No Tim	70731	WF	H 8.57 54	3x8x3½	T		
35		NF 5	4800	191	227	8350	B9.75/22	DB9.75/22	Own SCH	6-4½x4½	Wa T9	U 4 No Tim	70731	WF	H 8.57 50	1x8x3½	T		
36		NH 5	4925	149	170	8440	B9.75/22	DB9.75/22	Own SCH	6-4½x4½	Wa T9	U 4 No Tim	70731	WF	H 8.57 50	1x8x3½	T		
37		S 5	5500	158	168	8800	B9.75/22	DB9.75/22	Own SCH	6-4½x4½	Wa T9	U 4 No Tim	70731	WF	H 8.52 54	6x9x3½	T		
38		SE 6	5800	158	168	8950	B10.50/22	DB10.50/22	Own SCM	6-4½x4½	Wa T9	U 4 No Tim	70731	WF	H 8.52 54	6x9x3½	T		
39		C 7½	6600	158	176	10950	B10.50/24	DB10.50/24	Own SCM	6-4½x4½	BL 734	U 4 No Tim	70731	WF	H 9.92 121	10½x12½x3½	T		
40		CF 7½	6900	164	182	11280	B10.50/24	DB10.50/24	Wau	6-5x5	BL 734	U 4 No Tim	70731	WF	H 9.92 121	10½x12½x3½	T		
41		E 7½	6000	192	242	9975	B10.50/22	DB10.50/22	Own SCM	6-4½x4½	BL 734	U 4 No Tim	70731	WF	H 7.20 45	6x9x3½	T		
42		F 8½	6500	189	204	10760	B10.50/24	DB10.50/24	Wau	6-5x5	BL 734	U 4 No Tim	70731	WF	H 7.20 42	1x9x3½	T		
43		FE 20	9500	180	204	12300	B10.50/24	DB10.50/24	Wau	6-5x5	BL 734	U 4 No Tim	70731	WF	H 7.20 87	6x10x3½	T		
44	Available	(T) W140	1350	188	212	11200	4000	B7.00/20	DB7.00/20	Wau ZK	6-3½x4½	WQ T9	U 4 No Tim	52000H	WF	H 7.9 96	0x10x3½	T	
45		W200	22½	188	212	13400	4500	B7.50/20	DB7.50/20	Wau TL	6-3½x4½	BL 224	U 4 No Tim	54300H	WF	R 6.8 43	5x10x3½	T	
46		W230	2½-3	1850	188	212	16300	5300	B8.25/20	DB8.25/20	Wau	6-3½x4½	BL 224	U 4 No Tim	56200H	WF	R 7.4 47	12x12x3½	T
47		W300	3½	2770	182	196	20700	6000	B9.00/20	DB9.00/20	Wau	6-110	BL 524	U 4 No Tim	58200H	WF	R 7.8 56	12x12x3½	T
48		W400	4½	3650	Op	25500	8200	B9.75/20	DB9.75/20	Wau	6-125	BL 615	U 5 No Tim	60200H	WF	R 8.5 56	7x12½x3½	T	
49		T43	3½-4	3850	Op	25500	8150	B9.75/20	DB9.75/20	Wau	6-125	BL 615	U 5 No Tim	6270H	WF	R 8.5 56	7x12½x3½	T	
50		T45	4½	4985	Op	27000	8800	B9.75/20	DB9.75/20	Wau	6-125	BL 615	U 5 No Tim	6520H	WF	R 8.5 56	7x12½x3½	T	
51		T50	5	5350	Op	33000	9800	B9.75/20	DB9.75/20	Wau	6-125	BL 615	U 5 No Tim	6720H	WF	R 9.5 90	0x7x3½	T	
52	Biederman	A	10	1-1½	895	130	160	6000	B6.50/18	Con 25A	6-3½x4½	BL 51-703	U 4 No Tim	70731	WF	H 8.00 58	7x8½x3½	T	
53		20-1½	1195	145	175	8000	3200	B6.00/20	DB6.00/20	Con 25A	6-3½x4½	BL 51-703	U 4 No Tim	70731	WF	H 8.94 65	8x3½x3½	T	
54		25 1½-2	1250	160	175	10000	3450	B6.50/20	DB6.50/20	Con 25A	6-3½x4½	BL 51-703	U 4 No Tim	70731	WF	H 5.66 36	5x5x2½x3½	T	
55		30 1½-2	1495	163	178	12000</td													

TRUCK SPECIFICATIONS TABLE

+ FOR MEANING OF ABBREVIATIONS AND EXPLANATION OF REFERENCE MARKS SEE PAGE 54

Line Number	ENGINE DETAILS			Fuel Syst.	Elec-trical	Front Axle	Brakes	Body Mounting Data	Springs																			
	Piston Displacement	Compression Ratio	Torque lb. ft.						Main Bearings	Valve Arrangement	Piston Material	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	Lining Area	Drum Material	Hand Type, Location	Cab to Rear Frame	Cab to Rear Axle	Width of Frame	Front	Rear
			N.A.C.C. Rated H.P. R.P.M. Given						Number and Diameter	Length																		
1468	4.4	322	43.3	20-2200	H C	A-4-2½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
707	4.4	500	60.	175-2200	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
707	4.4	500	60.	175-2200	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
4248	5.0	150	27.7	65-2600	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
5298	4.7	192	33.7	65-2600	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
3339	4.7	225	38.4	73-2200	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
3339	4.7	225	38.4	73-2200	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
9428	4.7	238	40.3	73-2200	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
1078	4.7	318	51.2	103-2200	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
11478	4.4	318	51.2	103-2200	H C	A-7-3½	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
12201	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800	L G	GCCCCC	CC	Ha	Zen	V	DR	DR	P.B.L.	DR	Lo	Spi	Tim 27451	Ros	O41A	720	A	CD	172	102	33½	42x3	56x4	
14224	5.5	142	21.6	64-2800</td																								

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS.				FRAME	
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Front	Rear	Engine	Transmission	Rear Axle	Location and Forward Speeds	Aux. Location and Speeds	Gear Ratios
						Gross Vehicle Weight	Chassis Wt. (Stripped)	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	In High	In Low	Side Rail Dimensions
1	Corbitt (T) 12B6T	4-7	3465 (3) (3)	23900	4870	B8.25/20	DB8.25/20	Con E602	6-4½x4½	BL 335	U 4 No	Tim 56200H	SF H Op Op
2	(conc'd.) (T) 15B6T	5-8	4875 (3) (3)	30400	5870	B9.00/20	DB9.00/20	Con E603	6-4½x4½	BL 335	U 4 No	Tim 58200H	SF H Op Op
3	(T) 18D6T	8-10	5500 (3) (3)	36200	8100	B9.75/20	DB9.75/20	Con 22R	6-4½x5½	BL 535	U 5 No	Tim 5720H	SF H Op Op
4	(T) 24D6T	10-15	6500 (3) (3)	50600	9200	B10.50/20	DB10.50/20	Con 16H	6-4½x5½	BL 7212	U 4 No	Tim 66720H	SF H Op Op
5	Dart	30G 1½-2	1595 150 180	11200	4900	B6.50/20	DB6.50/20	Her WXAX2	6-3½x4½	Fu MLU	U 4 No	Tim 53200H	BF H 5.14 32.6
6	40G 2½-3	2195 150 180	13400	5650	B7.50/20	DB7.50/20	Her WXB	6-3½x4½	Fu MLU	U 4 No	Tim 54200H	BF H 6.8 34.6	
7	50G 2½-3	2725 150 180	16300	5750	B7.50/20	DB8.25/20	Her WCX2	6-4½x4½	Fu MLU	U 4 No	Tim 56200H	BF H 6.16 31.6	
8	60G 3	3250 166 208	20700	7425	B8.25/20	DB9.00/20	Her WCX3	6-4½x4½	Fu JYUOG	U 5 No	Tim 5720H	WF H 6.8 48.4	
9	80W 4	4450 170 220	25600	8500	B8.25/20	DB9.75/20	Her YXC2	6-4½x5½	Fu YUOG	U 5 No	Tim 58200H	WF H 6.8 48.4	
10	100W 5	5500 170 235	33600	11500	B8.75/20	DB9.75/20	Her RXC	6-5½x5½	Fu MHU	U 4 No	Tim 65200H	WF H 6.8 48.4	
11	150W 7½	6500 170 245	46000	11500	B8.75/20	DB10.50/20	Her RXB	6-5½x5½	BL 735	U 5 No	Tim 68720	WF H 6.8 42.7	
12	200W 10	8500 180 250	40400	12500	B8.75/20	DB10.50/20	Her RXB	6-5½x5½	BL 735	U 5 No	Tim 78310	WF H 6.8 42.7	
13	(4 Whl. Dr.) 60-4	5750 180 250	19000	8700	B9.00/20	DB9.00/20	Her WXCG3	6-4½x4½	Fu JVUOG	U 5 A 2 No	Tim 69317H	DF H 8.4 152.0	
14	(4 Whl. Dr.) 80-6	6500 180 225	24000	11000	B9.75/20	DB9.75/20	Her RXC	6-4½x5½	Fu JVUOG	U 5 A 2 No	Tim 69317H	DF H 8.4 152.0	
15	Day Elder (4)	895 135 156	3000	3300	B6.00/20	B6.50/20	Con 25A	6-3½x4½	WG T9	U 4 No	Tim 5200H	SF H 6.6 36.0	
16	85 1½-2	1395 135 168	8500	3850	B6.00/20	B6.50/20	Con 16C	6-3½x4½	WG T9	U 4 No	Tim 53200H	SF H 6.6 36.0	
17	110 2½-3	1825 156 186	10000	4800	B7.20/20	B8.20/20	Con 16C	6-3½x4½	WG T9	U 4 No	Tim 54200H	SF H 6.8 44.0	
18	150 2½-3	2225 157 199	13000	6600	B7.50/20	B7.50/20	Con 16R	6-4x4	BL 51	U 4 No	Tim 56200H	WF H 6.8 44.0	
19	160 3	2795 156 204	16000	6800	B7.50/20	B8.00/20	Con 18R	6-4x4	BL 51	U 4 No	Tim 65200H	WF H 6.8 44.0	
20	200 4	3295 156 204	20000	7600	B9.00/20	B9.00/20	Con 18R	6-4x4	BL 554	U 4 No	Tim 65200H	WF H 6.8 44.0	
21	2425 162 202	24000	9500	P38x9	P38x9	Con 21R	6-4½x4½	BL 535	U 5 No	Tim 66720H	WF H 6.8 44.0		
22	Diamond T 21½	545 135 158	8500	3100	B5.50/20	B6.50/20	Her JXA	6-3½x4½	WG T9	U 4 No	Cla 6364	S½ H 5.4 34.6	
23	210FE 1½-2	565 135 158	8500	3100	B5.50/20	B6.50/20	Her JXA	6-3½x4½	WG T9	U 4 No	Cla 6373E	S½ H 5.4 34.6	
24	240A 1½	795 137 167	10000	3500	B6.00/20	P32x6	Her JXA	6-3½x4½	WG T9	U 4 No	Cla 6410	SF H 6.0 36.0	
25	310 2	995 155 179	12900	4200	B6.50/20	B6.50/20	Her JXB	6-3½x4½	WG T9	U 4 No	Cla 6613	SF H 6.0 36.0	
26	350 2½-3	1295 155 179	14000	4700	B7.00/20	B7.00/20	Her JXC	6-3½x4½	Cla R103	U 5 U 5 No	Cla 6642	SF H 6.0 36.0	
27	410A 3	1695 160 194	15000	5400	B7.50/20	B7.50/20	Her WXC	6-4x4	Co W5B	U 5 No	Cla 6642	SF H 6.0 36.0	
28	410B 3	2135 200 200	15000	6200	B7.50/20	B7.50/20	Her WXC	6-4x4	Co RUS4C	U 4 No	Cla 6642	SF H 6.0 36.0	
29	504A 3	2650 166 208	17500	6420	B8.25/20	B8.25/20	Her WXC	6-4x4	Co RUS4C	U 4 No	Wls 69317BL	S½ H 5.4 34.6	
30	(N) 506A 3	2950 174 240	17500	6600	B8.25/20	B8.25/20	Her WXCG3	6-4½x4½	Co RU5C	U 5 U 5 No	Wls 69317BL	S½ H 5.4 34.6	
31	603 3-4	3395 169 230	20000	7540	B9.00/20	B9.00/20	Her YXC	6-4½x4½	Co RU5C	U 5 U 5 No	Wls 1237H	SF H 6.0 36.0	
32	(N) 606 3-4	3695 179 246	20000	7600	B9.00/20	B9.00/20	Her RXB	6-4½x5½	Co RU5C	U 5 U 5 No	Wls 1237H	SF H 6.0 36.0	
33	510 4	1995 168 201	18000	6000	B7.00/20	B8.25/20	Her WXC	6-4x4	Co RUS4C	U 4 No	Wls 5205H	SF H 6.0 36.0	
34	750 5-5	4925 178 238	24000	9300	B9.75/20	B9.75/20	Her RXC	6-4½x5½	Co SA5	U 5 No	Wls 1737 KW	SF H 6.0 36.0	
35	Differential E-131 2½-3	3200 160 160	18100	5100	B9.00/20	B9.00/20	Lyo ASD	6-3½x4½	BL 314	U 4 No	Tim 58200	BF H 7.8 51.4	
36	Dodge Bros. UF-10	375 109 109	4025	1925	B5.00/19	B5.00/19	Own	4-3½x4½	Own	U 3 No	Own	S½ H 4.66 13.9	
37	F-10	445 109 109	4125	1975	B5.25/19	B5.25/19	Own	6-3½x4½	Own	U 3 No	Own	S½ H 4.66 13.9	
38	4-1	490 124 124	4760	2260	B6.00/20	B6.00/20	Own	4-3½x4½	Own	U 3 No	Own	S½ H 5.11 19.2	
39	4-1	595 124 124	4860	2360	B6.00/20	B6.00/20	Own	6-3½x3½	Own	U 3 No	Own	S½ H 5.11 19.2	
40	UG20 9½-1	537 131 157	5900	2450	B7.50/17	B7.50/17	Own	4-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
41	G20 9½-1	597 131 157	5975	2520	B7.50/17	B7.50/17	Own	6-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
42	410A 3	1495 160 194	15000	5400	B7.50/20	B7.50/20	Own	6-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
43	410B 3	1525 160 194	15000	6200	B7.50/20	B7.50/20	Own	6-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
44	UG-30 1-2	525 131 157	8200	2490	B6.00/20	B32x6	Own	4-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
45	G30 1-2	585 131 157	8275	2560	B6.00/20	B32x6	Own	6-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
46	UF-30 11½-2	595 136 165	8225	2581	B6.00/20	B32x6	Own	4-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
47	F-30 1½-2	695 136 165	8275	2631	B6.00/20	B32x6	Own	6-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
48	F-35 1½-2½	1425 140 165	10175	3780	B6.00/20	B6.00/20	Own	6-3½x3½	Own	U 4 No	Own	SF H 5.85 36.1	
49	G43 2-3	795 136 165	10500	3345	B7.00/20	B7.00/20	Own	6-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
50	F-40 2-3½	1995 150 190	14590	5173	B6.50/20	B6.50/20	Own	6-3½x5½	Own	U 4 No	Own	SF H 5.85 36.1	
51	515 3-4	1515 185 185	12250	4235	B32x6	B32x6	Own	6-3½x4½	Own	U 4 No	Own	SF H 5.85 36.1	
52	(F) 6-1 3½-5½	2575 170 195	19429	5789	B32x6	B32x6	Own	6-3½x5½	Own	U 4 No	Own	SF H 5.85 36.1	
53	(G) 8-2 7½-13	5350 190 220	25000	8040	B9.75/20	B9.75/20	Own	8-3½x5½	Own	U 4 No	Own	SF H 7.1 69.6	
54	Douglas A61	1095 135 145	7500	3075	P30x5	P30x5	Bud J214	6-3½x4½	WG T9	U 4 No	Cla B3370	SF H 5.6 36.3	
55	B4 1½-2	2050 150 160	9000	3950	P30x5	P32x6	Bud WTU	4-3½x5½	Fu MKU12	U 4 No	Wls 4627	SF H 5.72 26.3	
56	B6 1½-2	2150 150 160	10500	4100	P30x5	P32x6	Bud HS6	6-3½x4½	Fu MKU12	U 4 No	Wls 4627	SF H 5.72 26.3	
57	C4 2	3275 156 160	12500	5100	P32x6	P34x7	Bud KBU-I	4-4x5½	Fu MGU14	U 4 No	Wls 6617	SF H 6.9 44.8	
58	C6 2	3425 168 160	15500	5850	P32x6	P34x7	Bud DW6	6-3½x5½	Fu MGU14	U 4 No	Wls 6617	SF H 6.9 44.8	
59	CD4 2½-3	3855 190 190	17500	5860	P34x7	P36x8	Bud KBU-I	4-4x5½	Fu MGU14	U 4 No	Wls 8817	SF H 6.9 44.8	
60	CD6 2½-3	3955 190 190	17500	5800	P34x7	P36x8	Bud DW6	6-3½x5½	Fu MGU14	U 4 No	Wls 8817	SF H 6.9 44.8	
61	D4 3	4010 186 200	20000	6500	S30x5*	S36x10*	Bud YBU-I	4-4x5½	Fu YU16	U 4 No	Wls 882A	SF H 6.9 44.8	
62	D6 3	4430 186 200	20000	6800	P36x7	P36x7	Bud GL6	6-4x5½	Fu YU16	U 4 No	Wls 882A	SF H 6.9 44.8	
63	D6 5p 3	5500 216 220	22000	7560	P38x7	P40x8	Bud K428	6-4½x5½	Fu HOG	U 4 No	Wls 1458	SF H 6.9 44.8	
64	F6 5	5500 185 200	26000	9200	S30x6	S40x12	Bud GL6	6-4x5½	Fu HOG	U 4 No	Wls 1458	SF H 6.9 44.8	
65	Duplex GF 2	6300 196 200	26000	9200	B9.75/20	B9.75/20	Bud GL6	6-4x5½	Fu HOG	U 4 No	Wls 1458	SF H 6.9 44.8	
66	GF 2												

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES	BODY MOUNT-ING DATA	SPRINGS									
	Piston Displacement	Compression Ratio	Max. Brake H.P. at R.P.M. Given	Torque lb. ft.	N.A.C.C. Rated H.P.	Valve Arrangement	Camshaft Drive	Piston Material	MAIN BEARINGS	Oilng System Type	Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Steering Gear Make	SERVICE	Hand Type, Location	Width of Frame	Front	Rear			
									Number and Diameter								Lining Area	Drum Material	Cab to Rear of Frame	Cab to Rear Axle					
1-300	1.4	240	40.8	90-2500	L	C	C	7-2-2	11 1/2	FP	No	Zen	M	DR	DR	P.BL	Pi	Tim 33000H	Ros	LAIHV	578 a	TD (3)	(3)	34	40x2 1/4
2-383	1.5	236	48.6	95-2500	H	C	A	7-2-2	11 1/2	FP	No	Zen	M	DR	DR	P.BL	Pi	Tim 33000H	Ros	LAIHV	660 a	TD (3)	(3)	34	40x2 1/4
3-500	2.2	310	48.6	121-2400	H	C	A	7-2-2	13 1/2	FP	No	Zen	M	DR	DR	D.BL	Pi	Tim 35000A	Ros	LAIHV	768 a	TD (3)	(3)	34	40x2 1/4
4-611	4.5	384	54.1	127-2300	L	G	A	7-2-2	13 1/2	FP	No	Zen	M	DR	DR	D.BL	Pi	Tim 26450W	Ros	W41A	921 a	TD (3)	(3)	34	46x3
5-260	4.4	152	29.4	65-2400	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	D.Fu	Ch	Tim 30000	Ros	LAIHV	280 a	TX 144	60	34	28x2 1/4
6-298	4.5	190	33.7	69-2400	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	D.Fu	Ch	Tim 31000	Ros	LAIHV	452 a	TX 156	66	34	38x2 1/4
7-360	4.5	212	40.8	82-2400	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	D.Fu	Ch	Tim 32000	Ros	LAIHV	260 a	TX 156	66	34	38x2 1/4
8-383	4.5	264	43.3	92-2400	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	D.Fu	Ch	Tim 35000	Ros	LAIHV	394 a	CD 192	84	34	45x3
9-453	5.5	300	46.8	98-2210	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	D.Fu	Ch	Tim 27450	Ros	LAIHV	768 a	CD 192	84	34	45x3
10-529	7.0	350	51.3	114-2200	L	G	A	7-2-2	14	PC	Ha	Zen	M	DR	DR	P.BL	Ch	Tim 27450	Ros	W4A	921 a	CD 108	33	34	46x3
11-707	7.0	150	50.0	115-2000	L	G	A	7-2-2	15 1/2	PC	Ha	Zen	M	DR	DR	P.BL	Ch	Tim 27450	Ros	W4A	921 a	CD 108	33	34	46x3
12-707	7.0	150	50.0	115-2000	L	G	A	7-2-2	15 1/2	PC	Ha	Zen	M	DR	DR	P.BL	Ch	Tim 27450	Ros	W4A	921 a	CD 108	33	34	46x3
13-384	5.5	232	43.3	99-2200	L	G	A	7-2-2	15 1/2	PC	Ha	Zen	M	DR	DR	D.Fu	Ch	Wia F211	Ros	L21H	433 a	CD 168	72	34	45x3
14-529	5.5	350	51.3	114-2000	L	G	A	7-2-2	14	PC	Ha	Zen	M	DR	DR	P.Fu	Ch	Wia F311	Ros	L21H	542 a	CD 192	84	34	45x3
15-214	1.9	142	27.3	71-3200	L	G	A	7-2-2	10 1/2	FP	No	Zen	M	DR	DR	P.BB	GO	Tim 30000H	Ros	LAIHV	269 a	TX 106 1/2	58 1/2	34	40x2 1/4
16-245	0.5	160	27.3	70-4200	L	G	A	7-2-2	10 1/2	FP	No	Zen	M	DR	DR	P.BB	Pe	Tim 30000H	Ros	LAIHV	269 a	TX 105	57	34	40x2 1/4
17-248	0.5	160	27.3	70-3200	L	G	A	7-2-2	10 1/2	FP	No	Zen	M	DR	DR	P.BB	Pe	Tim 31000H	Ros	LAIHV	281 a	TX 135	78 1/2	34	40x2 1/4
18-311	4.1	216	37.3	83-2400	H	C	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BL	Pe	Tim 33000H	Ros	LAIHV	353 a	TX 124 1/2	69	33 1/2	40x2 1/4
19-339	4.1	212	38.4	82-2400	H	C	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	D.BL	Pe	Tim 33000H	Ros	LAIHV	394 a	TX 132	80 1/2	34	42x2 1/2
20-339	4.1	212	38.4	81-2400	H	C	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BL	Pe	Tim 35000H	Ros	LAIHV	483 a	TX 132	80 1/2	34	42x2 1/2
21-427	4.1	257	45.9	100-2600	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BL	Pe	Tim 26450	Ros	LAIHV	692 a	TX 132	78	33	48x3
22-228	4.1	143	27.3	60-2800	L	G	A	7-2-2	10	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	186 a	TX 93	51 1/2	34	42x2 1/2
23-228	4.1	143	27.3	60-2800	L	G	A	7-2-2	10	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	186 a	TX 93	51 1/2	34	42x2 1/2
24-228	4.1	143	27.3	60-2800	L	G	A	7-2-2	10	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	186 a	TX 93	51 1/2	34	42x2 1/2
25-263	4.1	164	31.5	68-2800	L	G	A	7-2-2	10	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	350 a	TX 126	72	34	42x2 1/2
26-283	4.1	176	31.7	76-2500	L	G	A	7-2-2	10	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	350 a	TX 126	72	34	42x2 1/2
27-339	7.0	225	45.8	100-2800	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	350 a	TX 117	74 1/2	34	45 1/2 x 2 1/2
28-339	7.0	225	45.8	100-2800	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	408 a	TD Opt	113 1/2	34	45 1/2 x 2 1/2
29-339	7.0	225	45.8	100-2800	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	408 a	TD Opt	113 1/2	34	45 1/2 x 2 1/2
30-384	4.1	250	15.9	93-2200	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	408 a	TD Opt	113 1/2	34	45 1/2 x 2 1/2
31-428	4.1	250	15.9	93-2200	L	G	A	7-2-2	13 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	408 a	TD Opt	113 1/2	34	45 1/2 x 2 1/2
32-501	5.5	239	45.8	111-2200	L	G	A	7-2-2	12 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	408 a	TD Opt	113 1/2	34	45 1/2 x 2 1/2
33-339	7.0	225	45.8	100-2800	L	G	A	7-2-2	12 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	408 a	TD Opt	113 1/2	34	45 1/2 x 2 1/2
34-529	7.0	225	45.8	100-2800	L	G	A	7-2-2	12 1/2	PC	Ha	Zen	M	DR	DR	P.BB	GO	Tim 26450	Ros	LAIHV	408 a	TD Opt	113 1/2	34	45 1/2 x 2 1/2
35-299	9.0	198	33.7	85-2800	L	G	A	7-2-2	9 1/2	PC	Mo	Til	M	AL	AL	D.BL	Pe	Blo Tim 33000H	Ros	LAIHV	375 a	FD 20	77 1/2	34	42x2 1/2
36-196	6.0	124	21.0	48-2800	L	G	A	7-2-2	9 1/2	CC	No	Car	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
37-211	5.5	134	25.3	60-3100	L	G	A	7-2-2	9 1/2	CC	No	Car	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
38-196	6.0	124	21.0	48-2800	L	G	A	7-2-2	9 1/2	CC	No	Car	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
39-208	5.5	132	27.3	63-3200	L	G	A	7-2-2	10 1/2	CC	No	Zen	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
40-196	6.0	124	21.0	48-2800	L	G	A	7-2-2	10 1/2	CC	No	Zen	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
41-211	4.5	134	27.3	63-3200	L	G	A	7-2-2	10 1/2	CC	No	Zen	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
42-196	4.5	134	27.3	63-3200	L	G	A	7-2-2	10 1/2	CC	No	Zen	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
43-208	5.5	132	27.3	63-3200	L	G	A	7-2-2	10 1/2	CC	No	Zen	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56 1/2	34	42x2 1/2
50-309	4.5	200	11.5	96-3000	L	G	A	7-2-2	11 1/2	CC	No	Zen	M	DR	DR	P.BB	Fe	Own	Own	LAIHV	121 p	TX 121	56		

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS				FRAME			
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Front	Rear	Engine	Transmission	REAR AXLE		Side Rail Dimensions			
						Gross Vehicle Weight	Chassis Wt. (Stripped)	Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Gear Ratios	Type	
1 Garford	80Z ⁴	5330	175 192	24000	8400	S36x6	S36x14	Bud BA6	6-4½x5½	BI, 60-Max	A 7 No	Tim 66700	WF R 10.3 98.2	8x3½x2½	
(concluded)	100Z ⁵	5830	175 192	30000	9600	S36x6	S 0x14	Bud BA6	6-4½x5½	BL 60-Max	A 7 No	Tim 68700	WF R 10.1 95.0	8x3½x2½	
3 General Mot.	(6) T15 ½-1½	645	130 141	6500	2625	B5.50/20	B5.50/20	Own 200	6-3½x3½	Own	U 3 No	Own	WF R 4.86 16.1	6x2½x1½	
4	595	131 157	8200	2785	P30x5	P32x6	Own 200	6-3½x3½	Own	U 4 No	Own	WF R 5.43 35.7	6x2½x1½		
5	T19 1½-2½	745	130 164	10000	3110	B5.50/20	P32x6	Own 200	6-3½x3½	Own	U 4 Op	Own	WF R 6.2 40.7	6x2½x1½	
6	T25 1½-2½	1200	130 152	9000	3375	B6.00/20	B7.50/20	Bulek	6-3½x4½	Own	U 4 No	Own	WF R 5.83 29.6	6x2½x1½	
7	T23 2-3	745	131 157	10000	3080	B6.50/20	DB6.50/20	Own 200	6-3½x3½	Own	U 4 Op	Own	WF R 6.2 40.7	6x2½x1½	
8	T26 2-3	1210	130 164	11000	3685	B6.50/20	B8.25/20	Own 257	6-3½x4½	Own	U 4 No	Own	WF R 5.67 35.7	6x2½x1½	
9	T30 2-3	1545	141 164	12500	4490	P30x5	DP30x5	Bulck	6-3½x4½	Own	U 4 No	Own	WF R 5.63 28.6	6x2½x1½	
10	T31 2½-4	1695	141 181	14000	4695	P32x6	DP32x6	Own 257	6-3½x4½	Own	U 4 No	Own	WF R 5.63 35.5	6x2½x1½	
11	T42 2½-4	1845	141 181	15000	4725	P32x6	DP32x6	Bulck	6-3½x4½	Own	U 4 No	Own	WF R 5.57 33.4	6x2½x1½	
12	T44 3-4½	2065	141 181	16000	5095	P34x7	DP34x7	Bulck	6-3½x4½	Own	U 4 No	Own	WF R 8.05 40.9	6x2½x1½	
13	T45 3-4½	1865	141 181	16000	4910	P32x6	DP32x6	Own 257	6-3½x4½	Own	U 4 No	Own	WF R 6.57 41.4	6x2½x1½	
14	T51 4-5½	2465	155 200	19000	5955	P34x7	DP34x7	Own 331	6-3½x5	Own	U 4 No	Own	WF R 6.57 40.6	6x2½x1½	
15	T60 5-6½	3035	154 200	22000	6925	P34x7	DP34x7	Bulck	6-3½x5	Own	U 4 Op	Own	WF R 8.50 52.5	6x2½x1½	
16	T61 5½-6	3695	154 200	22000	7305	B9.00/20	DB9.00/20	Own 400	6-4½x5	Own	U 5 Op	Own	WF R 8.50 69.9	6x2½x1½	
17	T82 5-7	3795	155 201	24000	7500	B9.00/20	DB9.00/20	Own 331	6-3½x5	Own	U 4 A 3	Own	WF R 10.2 143	6x2½x1½	
18	T83 5-7½	4190	155 201	25000	7690	B9.00/20	DB9.00/20	Own 400	6-3½x5	Own	U 5 Op	Own	WF R 9.00 74.0	6x2½x1½	
19	T85 6-8	5000	171 204	30000	10630	B9.75/20	DB9.75/20	Own 525	6-4½x5½	Own	U 4 Op	Own	WF R 8.50 53.3	9½x4½x1½	
20	T110 8-12	8110	171 204	40000	12800	B10.50/24	DB10.50/24	Own 616	6-4½x5½	Own	U 4 A 3	Own	WF R 9.30 116.9	9½x4½x1½	
21 Gramm	AX4 1-1½	795	131 157	8000	3350	B6.50/20	B6.50/20	Con W10	4-3½x4½	WG TA	U 4 No	Tim 53200H	WF R 5.66 36.3	6x2½x1½	
22	AX6 1-1½	895	131 157	8000	3550	B6.50/20	B6.50/20	Con 25A	6-3½x4½	WG T9	U 4 No	Tim 53200H	WF R 5.66 36.3	6x2½x1½	
23	BX4 1½-2	895	131 210	10000	3525	B6.00/20	DB6.00/20	Con W10	4-3½x4½	WG T9	U 4 No	Tim 53200H	WF R 6.2 39.6	6x2½x1½	
24	BX6 1½-2	995	131 210	10000	3725	B6.00/20	DB6.00/20	Con 25A	6-3½x4½	WG T9	U 4 No	Tim 53200H	WF R 6.2 39.6	6x2½x1½	
25	BXF 1½-2	149.5	131 210	10000	4000	B6.00/20	DB6.00/20	Lyc ASD	6-3½x4½	BL 314	U 4 No	Tim 53200H	WF R 5.66 37.0	6x2½x1½	
26	B 2-2½	1295	140 196	12000	4150	B6.50/20	DB6.50/20	Lyc 4SL	6-3½x4½	CA A4J	U 4 No	Tim 54200H	WF R 5.83 37.1	6x2½x1½	
27	BF 2-3	1695	140 210	12000	4300	B6.50/20	DB6.50/20	Lyc A'D	6-3½x4½	BL 314	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
28	CX4 2-3	1095	131 210	12000	3950	B6.50/20	DB6.50/20	C n 20	4-4½x4½	WG T9	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
29	CX6 2-3	1295	131 210	12000	4150	B6.50/20	DB6.50/20	Con 16C	6-3½x4½	WG T9	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
30	C 2-3	1795	131 210	12000	4870	B7.00/20	DB7.00/20	Lyc AS	6-3½x4½	BL 314	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
31	CXH 2-3	1345	131 210	13400	4300	B6.50/20	DB6.50/20	Her JXC	6-3½x4½	BL 234	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
32	CF 2-3	1815	160 224	14000	4900	B7.50/20	DB7.50/20	Lyc ASD	6-3½x4½	BL 314	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
33	CXF 2-3	2395	160 224	14000	5100	B7.50/20	DB7.50/20	Con 208	6-3½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
34	D 2-3	1995	160 224	17000	5100	B7.50/20	DB7.50/20	Lyc A'D	6-3½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
35	DF 2-3	2695	160 224	17000	5300	B7.50/20	DB7.50/20	Con 11R	6-3½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
36	EX 2-3	2295	160 224	16300	5200	B8.25/20	DB8.25/20	Con E601	6-3½x4½	BL 324	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
37	E330 3-4½	2595	160 224	20000	5950	B8.25/20	DB8.25/20	Lyc TS	6-3½x5	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
38	ED 3-4½	3995	160 224	20000	6100	B8.25/20	DB8.25/20	Lyc AS	6-3½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
39	EY190 3-4½	3595	199 190	16000	6750	B7.50/20	DB7.50/20	Con 208	6-3½x4½	Co Rus 4	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
40	G-Y 4-6	4345	199 210	18000	7700	B7.50/20	DB7.50/20	Lyc ASD	6-3½x4½	Co Rus 4	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
41	G-F 4-6	3695	150 225	24000	7950	B9.00/20	DB9.00/20	Con 21R	6-3½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
42	GW 5-7½	5500	150 225	24000	9050	B9.75/20	DB9.75/20	Her HNC	6-5½x6	BL 744	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
43	GWD 5-7½	6495	157 240	28000	9500	B9.00/20	DB9.00/20	Con 21R	6-4½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
44	HY 5-7½	6595	210 236	22000	10100	B9.00/20	DB9.00/20	Cum H. Die	6-4½x4½	BL 744	U 4 No	Tim 1257KWB	WF R 5.75 21.2	12½x3½x1½	
45	G-P 6-8	1665	154 160	15000	3650	B7.00/20	DB7.00/20	Wa 6-90-255	6-3½x4½	Fu MKU	U 4 No	Tim 53200H	WF R 6.6	9x3½x3½	
46	(7) T65 2-3	1665	154 175	18000	5975	B8.25/20	DB8.25/20	Wa 6-90-255	6-3½x4½	Fu M380	U 5 No	Tim 54200H	WF R 7.4	12½x3½x1½	
47	663 3-4½	4170	162 179	20000	7530	B9.00/20	DB9.00/20	Wa 6-110-358	6-4½x5½	Fu VUOG	U 5 No	Tim 54200H	WF R 8.1 56.6	14½x3½x1½	
48	675 3-4½	5445	162 179	24000	8550	B9.75/20	DB9.75/20	Wa 6-125-462	6-4½x5½	Fu VUOG	U 5 No	Tim 54200H	WF R 8.1 56.6	14½x3½x1½	
49	Hahn-Selden	17	1500	142 162	7900	3750	P32x6	Con 18E	6-3½x4½	BL 20	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
50	Hahn-Selden	17 ½	1610	142 162	7900	3900	P32x6	Con 18E	6-3½x4½	BL 35	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
51	317 ½	1935	151 181	10000	4800	P32x6	DP32x6	Con 16C	6-3½x4½	BL 35	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
52	39 2½	2920	164 190	13000	5800	P32x6	DP32x6	Con 16R	6-4½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
53	47B 3	3785	151 198	15500	7200	P34x7	DP34x7	Con 18R	6-4½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
54	47D 4	4435	151 198	19500	7800	P36x8	DP36x8	Con 21R	6-4½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
55	47F 4	4975	151 198	23500	8700	P36x8	DP36x8	Con 21R	6-4½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
56	67 5	3500	151 198	23500	8700	P36x8	DP36x8	Con 21R	6-4½x4½	BL 554	U 4 No	Tim 54200H	WF R 5.83 37.0	6x2½x1½	
57	Hendrickson	178 2½	3350	Op Op	15300	6500	B8.25/20	DB8.25/20	Wa 6-110-110	6-4½x4½	Fu JVU	U 5 No	Tim 54200H	WF R 8.95 119	8x3½x1½
58	198 3	3800	Op Op	19500	7000	B9.00/20	DB9.00/20	Wa 6-110	6-4½x4½	Fu JVU	U 5 No	Tim 54200H</			

Line Number	Piston Displacement	ENGINE DETAILS										Front Axle	BRAKES				BODY MOUNTING DATA		Springs						
		Max. Brake H.P. at R.P.M. Given		N.A.C.C. Rated H.P. at R.P.M.		Main Bearings		Valve Arrangement		Piston Material		Fuel Syst.	Electrical	Front Axle		Brake Type, Location		Hand Type, Location							
		Camshaft Drive	Piston Material	Number and Diameter	Length	Oil System Type	Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	Lining Area	Drum Material	Cab to Rear Axle	Width of Frame					
1	41411	4.5	270	40.8	83-2100	L/G/C	4-2-2-2-2-2	9 1/2	PC	Zen	AL	AL	D.Ow	Lo	Tim 26450H	Ros L41H	618/a	FX	144	94 1/2	34	42x3	56x3		
2	41411	4.5	270	40.8	83-2100	L/G/C	4-2-2-2-2-2	9 1/2	PC	Zen	AL	AL	D.Ow	Lo	Tim 27450H	Ros L41H	568/a	FX	144	94 1/2	34	42x3	56x4		
3	200	4.5	9	127	26.3	60-3000	L/G/C	3-2-2-2-2-2	r/r	PP	PC	PC	No	Blo	Tim 210	Jac B41M	211/a	41	87	48	34	38x2	50 1/2 x 2 1/2		
4	200	5.1	131	26.3	66-3200	L/G/C	3-2-2-2-2-2	r/r	PP	PC	PC	PC	No	Blo	Tim 210	Jac B41M	175/pa	21	85 1/2	50 1/2	37	36x1 1/2	45x2 1/2		
5	200	5.1	131	26.3	66-3200	L/G/C	3-2-2-2-2-2	r/r	PP	PC	PC	PC	No	Blo	Tim 210	Jac B41M	290/a	TX	87	48	34	38x2	50 1/2 x 2 1/2		
6	257	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	239/pa	TX	87	48	34	38x2	50 1/2 x 2 1/2		
7	200	5.1	132	26.3	66-3200	H/G/C	3-2-2-2-2-2	r/r	PP	PC	PC	PC	No	Blo	Tim 175	Jac B41M	215/pa	21	85 1/2	50 1/2	37	36x1 1/2	45x2 1/2		
8	257	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	290/a	TX	87	48	34	38x2	50 1/2 x 2 1/2		
9	257	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	288/a	TX	107	59	34	38x2	50 1/2 x 2 1/2		
10	257	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	345/a	TX	107	59	34	38x2	50 1/2 x 2 1/2		
11	257	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	320/a	TX	107	59	34	38x2	50 1/2 x 2 1/2		
12	257	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	345/a	TX	107	59	34	38x2	50 1/2 x 2 1/2		
13	257	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	379/a	TX	125	70	34	40x3	50x3		
14	331	4.4	230	33.7	94-2500	H/G/A	4-2-2-2-2-2	9 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	418/a	TZ	125	69	34	40x3	50x3		
15	331	4.4	230	33.7	94-2500	H/G/A	4-2-2-2-2-2	9 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	449/a	TX	125	69	34	40x3	50x3		
16	400	4.6	290	40.9	10-3000	H/G/A	4-2-2-2-2-2	9 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	483/a	TZ	120	74	34	40x3	50x3		
17	331	4.4	230	33.7	94-2500	H/G/A	4-2-2-2-2-2	9 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	517/a	TX	125	70	34	40x3	50x3		
18	400	4.6	290	40.9	10-3000	H/G/A	4-2-2-2-2-2	9 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	594/a	TZ	120	74	34	40x3	50x3		
19	252	4.5	185	28.3	76-2500	H/G/C	4-2-2-2-2-2	8 1/2	PC	Ha	PC	PC	No	Blo	Tim 175	Jac B41M	638/a	TX	137	82	34	38x2	50 1/2 x 2 1/2		
20	210	4.5	121	24.0	50-2800	A/G/C	4-2-2-2-2-2	9 1/2	PC	Ha	Str	AL	D.Ow	Lo	Tim 26450H	Ros L41H	249/pa	FD	81 1/2	51	34	38x2	45x2 1/2		
21	224	5.5	132	27.4	71-3200	A/G/C	4-2-2-2-2-2	9 1/2	PC	Ha	Str	AL	D.Ow	Lo	Tim 30000H	Ros L41H	249/pa	FD	81 1/2	51	34	38x2	45x2 1/2		
22	278	5.5	132	27.4	71-3200	A/G/C	4-2-2-2-2-2	9 1/2	PC	Ha	Str	AL	D.Ow	Lo	Tim 30000H	Ros L41H	249/pa	FD	81 1/2	51	34	38x2	45x2 1/2		
23	241	5.5	142	27.4	71-3200	A/G/C	4-2-2-2-2-2	9 1/2	PC	Ha	Str	AL	D.Ow	Lo	Tim 30000H	Ros L41H	249/pa	FD	81 1/2	51	34	38x2	45x2 1/2		
24	279	5.5	142	27.4	71-3200	A/G/C	4-2-2-2-2-2	9 1/2	PC	Ha	Str	AL	D.Ow	Lo	Tim 30000H	Ros L41H	260/a	FD	94	60	34	40x2	50x2 1/2		
25	224	4.7	146	25.3	61-2900	A/G/C	4-2-2-2-2-2	9 1/2	PC	Ha	Str	AL	D.Ow	Lo	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2		
26	279	4.9	198	33.7	85-2800	L/G/C	4-2-2-2-2-2	9 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
27	224	4.7	146	25.3	61-2900	L/G/C	4-2-2-2-2-2	9 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
28	227	4.7	136	27.2	55-2400	L/G/C	3-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
29	248	5.0	127	27.3	70-3000	L/G/C	3-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
30	278	5.5	182	31.5	85-3300	L/G/C	4-2-2-2-2-2	9 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
31	282	5.5	176	33.7	73-2800	H/G/N	5-3-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
32	299	4.9	198	33.7	85-2800	L/G/C	4-2-2-2-2-2	9 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
33	380	4.3	238	40.8	88-2400	H/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
34	299	4.9	198	33.7	85-2800	L/G/C	4-2-2-2-2-2	9 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
35	425	4.5	126	24.5	9	100-2200	H/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2
36	318	4.5	137	27.3	80-2700	L/G/C	4-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 33000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
37	353	4.5	185	36.1	98-2700	L/G/C	4-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 33000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
38	448	1.7	280	38.0	83-1800	H/G/N	5-3-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 33000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
39	380	4.3	238	40.8	88-2400	H/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 33000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
40	428	4.1	268	45.9	100-2200	H/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
41	428	4.1	268	45.9	100-2200	H/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
42	779	4.5	150	37.0	123-1800	H/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
43	611	4.1	188	34.1	127-2300	H/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
44	611	4.1	188	34.1	127-2300	H/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
45	616	5.0	150	37.0	65-2760	L/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	260/a	FD	81	51	34	38x2	45x2 1/2	
46	255	4.8	182	37.3	90-3200	F/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 30000H	Ros L41H	268/a	FD	71	31	34	40x2	54x3	
47	255	4.8	182	37.3	90-3200	F/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 31000H	Ros L41H	342/a	CD	72	31	34	40x2	54x3	
48	358	4.8	254	34.4	110-2800	F/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	394/a	CD	74 1/2	34	34	40x3	58x3 1/2	
49	625	4.5	137	27.3	66-3000	F/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.Jo	Pe	Tim 35000H	Ros L41H	574/a	FD	86	34	34	40x3	58x3 1/2	
50	214	5.0	137	27.3	66-3000	F/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.B.L	Ch	Tim 11703H	Ros L41H	380/a	TX	110	64	34	41x2	50x2 1/2	
51	248	5.0	150	37.0	65-2760	L/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.B.L	Ch	Tim 11703H	Ros L41H	452/a	TX	120	73	34	41x2	50x2 1/2	
52	248	5.0	150	37.0	65-2760	L/G/C	7-2-2-2-2-2	10 1/2	PC	Mo	Zen	V	AL	D.B.L	Ch	Tim 14703H	Ros L41H	578/a	TD	120	71	34	41x2	50x2 1/2	
53	311	4.1	199	34.4																					

Line Number	MAKE AND MODEL	GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS				FRAME						
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight		Front	Rear	ENGINE	TRANSMISSION	REAR AXLE						
						Chassis Wt. (Stripped)						Make and Model	Location and Forward Speeds					
1. Lange (concluded)	F16 ⁴	5500	148	88	23000	8600	P40x8	DP40x8	Her YXC	6-4½x4½	BL 60	A 7	WIS 1552B	2F	R 10.0	95.5	8x3x3	P
2. T	T 5	5775	148	188	26000	9200	P40x8	DP40x8	Her YXC ²	6-4½x4½	BL 60	A 7	WIS 1700	2F	R 10.0	96.0	8x3x3	C
3. VA	6000	148	242	26000	9950	P9.75/24	DP9.75/24	Her RXC	6-4½x5½	BL 714	A 7	WIS 1737KW	2F	R 8.05	Opt	7x2½x4½	C	
4. Le Moon	150 ¹ ¹ ¹ ¹ ¹	1150	140	152	8000	3300	B6.50/20	B6.50/20	Con 16C	6-3½x4½	BL 214	A 7	Tim 53200H	BF	H 5.14	31.8	6x3x3	C
5.	300 ² ³ ⁴ ⁵ ⁶	1350	140	158	11200	3600	B6.50/20	B6.50/20	Con 16C	6-3½x4½	BL 214	A 7	Tim 53200H	BF	H 5.14	31.8	6x3x3	C
6.	400 ² ³ ⁴ ⁵ ⁶	1755	163	190	12600	4200	B7.50/20	DB7.50/20	Con 16C	6-3½x4½	BL 214	A 7	Tim 53200H	BF	H 6.80	42.0	6½x3x3	C
7.	500 ² ³ ⁴ ⁵ ⁶	2175	163	190	15300	5000	B8.25/20	DB8.25/20	Wau 6M	6-3½x4½	BL 314	A 7	Tim 53200H	BF	H 6.80	40.6	6½x3x3	C
8.	600 ² ³ ⁴ ⁵ ⁶	2775	160	190	19500	6000	B9.00/20	DB9.00/20	Wau 6SRL	6-4½x5½	BL 314	A 7	Tim 53200H	BF	H 6.14	40.6	6½x3x3	C
9.	700 ² ³ ⁴ ⁵ ⁶	3150	160	190	19500	6500	B9.00/20	DB9.00/20	Wau 6SRL	6-4½x5½	BL 314	A 7	Tim 53200H	BF	H 6.14	40.6	6½x3x3	C
10.	800 ² ³ ⁴ ⁵ ⁶	3450	160	199	21600	7200	B9.75/20	DB9.75/20	Wau 6SRL	6-4½x5½	BL 314	A 7	Tim 53200H	BF	H 6.00	43.2	7x3x3	C
11. Maccar	100 ¹ ² ³ ⁴ ⁵ ⁶	1330	151	167	10000	4165	B6.50/20	DB6.50/20	Bud J214	6-3½x4½	BL 314	A 7	Tim 53200H	BF	H 6.2	39.6	7x3x3	C
12.	364 ¹ ² ³ ⁴ ⁵ ⁶	2050	155	183	12000	4850	B7.00/20	DB7.00/20	Bud H298	6-3½x4½	BL 314	A 7	Tim 53200H	BF	H 6.16	38.2	6½x3x3	C
13.	404 ¹ ² ³ ⁴ ⁵ ⁶	2400	155	183	15000	5350	B7.50/20	DB7.50/20	Bud H298	6-3½x4½	BL 314	A 7	Tim 53200H	BF	H 6.0	49.3	9x3x3	C
14.	180 ³ ⁵ ⁶	3500	181	213	18000	7400	B9.00/20	DB9.00/20	Bud K393	6-4½x4½	BL 554	A 7	WIS 8787L	2F	R 6.0	37.4	8x3x3	C
15.	56 ³ ⁵ ⁶	3350	153	194	18000	6200	B8.25/20	DB8.25/20	Bud DW6	6-3½x5½	BL 51	A 7	WIS 6787L	2F	R 7.00	37.4	8x3x3	C
16.	60 ³ ⁵ ⁶	3950	153	207	18000	6600	B9.00/20	DB9.00/20	Bud BA6	6-4½x5½	BL 514	A 7	Tim 75200H	WF	H 6.8	44.5	12x3x3	T
17.	60A ⁴ ⁶	4750	153	207	22000	7300	B9.75/20	DB9.75/20	Bud BA6	6-4½x5½	BL 554	A 7	Tim 75200H	WF	H 6.8	43	8x3x3	C
18.	66A ⁴ ⁶	5500	18	235	22000	8200	B9.75/20	DB9.75/20	Her YXC ³	6-4½x4½	BL 615	A 5	Tim 65720W	WF	H 6.6	47.9	9x3x3	C
19.	220H ⁴ ⁶	4500	180	213	22000	8750	B9.75/20	DB9.75/20	Wau 6SRK	6-4½x5½	BL 615	A 5	Tim 65720W	WF	H 6.6	47.9	9x3x3	C
20.	220W ⁴ ⁶	5000	181	213	22000	8750	B9.75/20	DB9.75/20	Wau 6SRK	6-4½x5½	BL 615	A 5	Tim 65720W	WF	H 6.6	47.9	9x3x3	C
21.	86A ⁵ ⁸	5950	184	235	30000	9500	B10.50/20	DB10.50/20	Her YXC ³	6-4½x4½	BL 70	A 5	Tim 66720W	WF	H 7.6	49.8	12x3x3	C
22. Mack	BL ¹ ² ³	2500	183	148	9500	4050	B6.00/20	DB6.00/20	Own BL	6-3½x5½	Own BG	A 7	Tim 52000B2	SF	H 5.66	27.9	7x3x3	T
23.	BG ¹ ² ³ ⁴	3000	183	192	12000	4800	P32x6	DP32x6	Own BG	6-3½x5½	Own BX	A 7	WIS 8787L	SF	H 5.44	26.8	7x3x3	T
24.	BP ¹ ² ³ ⁴	4200	156	198	16000	6600	B8.25/20	DB8.25/20	Own BG	6-3½x5½	Own AB	A 7	WIS 6787L	SF	H 7.00	37.4	8x3x3	C
25.	AB ³ ⁵ ⁶	4000	147	219	17500	6450	P34x7	DP34x7	Own AB	4-4½x4½	Own AB	A 7	Tim 75200H	WF	H 6.8	43	8x3x3	C
26.	AB ³ ⁵ ⁶	4200	147	219	17500	6700	P34x7	DP34x7	Own AB	4-4½x4½	Own AB	A 7	Tim 75200H	WF	H 6.8	43	8x3x3	C
27.	AB ³ ⁵ ⁶	4150	147	219	17500	6450	P34x7	DP34x7	Own AB	4-4½x4½	Own AB	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
28.	AB ³ ⁵ ⁶	4500	147	219	17500	6700	P34x7	DP34x7	Own AB	4-4½x4½	Own AB	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
29.	BM ³ ⁵ ⁶	4700	157	217	21500	7500	B9.00/20	DB9.00/20	Own BC	6-4½x5½	Own BC	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
30.	BC ⁴ ⁶	5250	154	226	23500	7850	P36x8	DP36x8	Own BC	6-4½x5½	Own BC	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
31. BC ⁴ ⁶	5500	154	226	23500	8000	P36x8	DP36x8	Own BC	6-4½x5½	Own BC	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C	
32.	BX ⁴ ⁶	6000	160	214	24800	7900	B9.75/22	DB9.75/22	Own BX	6-4½x5½	Own BX	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
33.	BX ⁴ ⁶	5600	160	214	24700	8050	B9.75/22	DB9.75/22	Own BX	6-4½x5½	Own BX	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
34.	BJ ⁵ ⁸	6450	165	245	31500	9800	B10.50/22	DB10.50/22	Own AL	6-4½x5½	Own AL	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
35.	BQ ⁵ ⁸	6800	160	228	32600	10000	B10.50/22	DB10.50/22	Own AL	6-4½x5½	Own AL	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
36.	AK ⁵ ⁸	5150	162	228	28500	9400	B10.50/24	DB10.50/24	Own AC	4-4x8	Own AC	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
37.	AK ⁵ ⁸	6450	162	228	32300	11700	S36x7	DS40x8	Own AP	6-4½x5½	Own AP	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
38.	BU-S ⁷	6250	207	225	9000	9200	B9.75/24	DB9.75/24	Own AR	6-4½x5½	Own AR	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
39.	AC Light ⁹	4950	168	240	29000	9200	B10.50/24	DB10.50/24	Own AC	4-4x8	Own AC	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
40.	AC Medium ⁹	5500	168	240	32000	9800	S36x7	DS40x8	Own AC	4-4x8	Own AC	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
41.	AC Heavy ⁹	6000	168	240	37000	10150	S36x7	DS40x8	Own AC	4-4x8	Own AC	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
42.	AP ⁷ ¹⁰ -10	8500	191	191	36500	11700	S36x7	DS40x8	Own AP	4-4x8	Own AP	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
43.	Mar.-Herr. TL ² ² ³ ⁴ ⁵ ⁶	3755	120	135	12000	5500	B7.50/20	DB7.50/20	Her XWC	6-3½x4½	BL 328	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
44.	(All 4 Wh. Dr.) TL ² ² ³ ⁴ ⁵ ⁶	4255	158	188	15250	15250	B7.50/20	DB7.50/20	Her XWC	6-4½x4½	BL 328	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
45. Mar.-Herr. TL ² ² ³ ⁴ ⁵ ⁶	4950	158	188	17200	7700	B7.25/22	DB7.25/22	Her XWC	6-4½x4½	BL 328	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C	
46. Oshkosh JSW ¹ ² ³ ⁴ ⁵ ⁶	2900	149	149	19370	8370	B9.00/20	DB9.00/20	Her XWC ³	6-4½x4½	BL 328	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C	
47.	TL-30 ³ ⁴ ⁵ ⁶	5455	158	188	20300	9200	B10.50/24	DB10.50/24	Her XWC ³	6-4½x4½	BL 328	A 7	Tim 75200H	WF	H 7.2	37.4	8x3x3	C
48.	TH-300 ³ ⁴ ⁵ ⁶	6285</td																

Line Number	ENGINE DETAILS						FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES	BODY MOUNT-ING DATA	SPRINGS																			
	Piston Displacement	Compression Ratio	Max. Brake H.P. at R.P.M. Given	Torque lb. ft.	N.A.C.C. Rated H.P.	Main Bearings						Oiling System Type	Governor Make	Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Universals Make	Steering Gear Make	Make and Model	Hand Type, Location	Service	Lining Area	Drum Material	Hand Type, Location	Cab to Rear of Frame	Width of Frame	Front	Rear	Auxiliary Type
	Number and Diameter	Length																													
1428	4	4	280	45.9	94-2200	L G C C	7-3	15	PC	Pe	Str	M AL	AL	D BL	Mo	Spi	Tim	16300	Ros	W21M	G	TD	154½	99½	37	44x3	56x4				
1453	4	5	300	48.6	99-2200	L G C C	7-3	15	PC	Pe	Str	M LN	LN	P BL	Mo	Spi	Tim	16300	Ros	W20G	G	TD	154½	99½	37	44x3	56x4				
329	4	5	350	51.3	112-2200	L G C C	7-2½	12½	PC	Ha	Str	M DR	DR	D BL	Ch	Mo	Tim	26450W	Ros	W41A	G	TD	Opt	33	44x3	56x3					
24	4	150	51.3	65-2800	L G C C	7-2½	10½	PC	No	Str	M DR	DR	D BL	Ch	Mo	Tim	30000H	Ros	L41H	G	TX	96	58	34	37½x22½	50x2½					
5	248	4	150	51.3	65-2800	L G C C	7-2½	10½	PC	No	Str	M DR	DR	D BL	Ch	Mo	Tim	30000H	Ros	L41H	G	TX	128	81	34	37½x22½	50x2½				
6	248	4	150	51.3	65-2800	L G C C	7-2½	10½	PC	No	Str	M DR	DR	D BL	Ch	Mo	Tim	31000H	Ros	L41H	G	TX	128	81	34	37½x22½	50x2½				
7	315	4	6	200	33.7	L G C C	7-2½	12½	PC	No	Str	M DR	DR	D BL	Ch	Mo	Tim	33000H	Ros	L41H	G	TX	128	81	34	37½x22½	50x2½				
8	381	4	4	242	40.8	L G C C	7-2½	12½	PC	No	Str	M DR	DR	D BL	Ch	Mo	Tim	35000H	Ros	L41HV	G	CD	128	81	34	39x2½	53x3				
9	462	4	5	300	45.9	L G C C	7-3	13½	PC	Wa	Str	M DR	DR	D BL	Ch	Mo	Tim	35000H	Ros	L41HV	G	CD	128	81	34	39x2½	53x3				
10	462	4	5	300	45.9	L G C C	7-3	13½	PC	Wa	Str	M DR	DR	D BL	Ch	Mo	Tim	35000H	Ros	L41HV	G	RI	128	81	34	39x2½	53x3				
11	260	4	5	162	27.3	L G C C	7-2½	10½	PC	Ha	Str	M DR	DR	P BB	Pe	Sp	Tim	30000H	Ros	L41H	G	TD	118	80	32	40x2½	54x3				
12	298	4	7	188	33.7	L G C C	7-2½	10½	PC	Ha	Str	M DR	DR	P BL	Pe	Sp	Tim	31000H	Ros	L41H	G	TD	114	72½	32	42x2½	54x2½				
13	298	4	7	188	33.7	L G C C	7-2½	10½	PC	Ha	Str	M DR	DR	P BL	Pe	Sp	Tim	31000H	Ros	L41H	G	TD	114	72½	32	42x2½	54x2½				
14	393	4	5	250	42.1	L G C C	7-3	11½	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	31000H	Ros	L41H	G	TD	143½	91	32	42x2½	58½x3				
15	331	4	5	200	33.7	L G C C	7-2½	12½	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	107½	70	32	42x2½	54x3				
16	411	4	5	272	40.8	L G C C	7-2½	12½	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	104½	68	32	42x2½	54x3				
17	411	4	5	272	40.8	L G C C	7-2½	12½	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	104½	68	32	42x2½	54x3				
18	479	4	5	331	51.3	L G C C	7-3	14	PC	Zen	Str	M DR	DR	D BL	Pe	Sp	Tim	26450TW	Ros	W41A	G	TD	527	104	68	32	42x2½	54x3			
19	177	4	5	335	51.3	L G C C	7-3	14	CC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	600	102	33	42x2½	58½x3				
20	517	4	5	335	51.3	L G C C	7-3	14	CC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000TW	Ros	W41A	G	TD	143½	91	32	42x2½	58½x3				
21	479	4	5	318	42.2	L G C C	7-3	14	PC	Zen	Str	M DR	DR	D BL	Pe	Sp	Tim	26450TW	Ros	W41A	G	TD	144	95	33	42x2½	58x3				
22	488	4	5	145	25.4	L G C C	7-2½	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	31000H	Ros	L41H	G	TD	109	64½	33½	40x2½	52½x2½				
23	309	4	5	183	31.5	L G C C	7-2½	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	96	54½	33½	42x2½	54x3				
24	309	4	5	183	31.5	L G C C	7-2½	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	81	34	42x2½	54x3				
25	283	4	5	176	28.9	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
26	283	4	5	176	28.9	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
27	309	4	5	183	31.5	L G C C	7-2½	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
28	309	4	5	183	31.5	L G C C	7-2½	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
29	414	4	5	261	38.4	L G C C	7-3	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
31	414	4	5	261	38.4	L G C C	7-3	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
32	468	4	5	261	38.4	L G C C	7-3	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
33	468	4	5	292	43.4	L G C C	7-3	16	PC	Ha	Str	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
34	525	4	5	380	45.9	L G C C	4-3½	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	120	73	33	42x2½	54x3				
35	611	5	0	398	54.2	L G C C	4-3½	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	150	102	33	50x3½	58½x3½				
36	471	4	9	320	40.0	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
37	471	4	9	320	40.0	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
38	611	4	0	398	54.2	L G C C	7-2½	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
39	468	4	7	292	43.4	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
40	471	4	7	292	43.4	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
41	471	4	9	320	40.0	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
42	471	4	9	320	40.0	L G C C	7-3	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
43	611	5	0	398	54.2	L G C C	4-3½	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	132	93	37	48x3½	52x4				
44	706	4	9	320	40.0	L G C C	4-3½	16	PC	Ps	Ow	M DR	DR	D BL	Pe	Sp	Tim	35000H	Ros	L41H	G	TD	108½	37	34	40x2½	52x4				
45	282	4	7	210	33.7	L G C C	7-2½	16	PC	Ps	Ow																				

Line Number	MAKE AND MODEL	Wheels Driven—6-Wheelers			GENERAL (See Keynote)			TIRE SIZE		MAJOR UNITS			FRAME			
					Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Front	REAR AXLE	GEAR RATIOS	Side Rail Dimensions				
		Tonnage Rating							Rear	ENGINE	TRANSMISSION		In High	In Low	Type	
1 Schacht (concluded) 40H 5-7	4295	154	235	25500	7600	B9.75/20	DB9.75/20	Her YXC	6-4 3/4 x 4 3/4	Fu VUOG	U 5	No Own	2F	R 7.07 49.7	8 1/8 x 3x 1/8	P
2 (concluded) 40HB 7-9	4695	154	235	29500	7750	B10.50/20	DB10.50/20	Her YXC	6-4 3/4 x 4 3/4	Fu VUOG	U 5	No Wls	2F	R 7.07 49.7	8 1/8 x 3x 1/8	P
3 66HA 8-11	5895	152	247	35000	9820	B10.50/24	DB10.50/24	Her RXC	6-4 3/4 x 5 1/2	Fu VUOG	U 5	No Wls	2F	R 7.07 49.7	8 1/8 x 3x 1/8	C
4 (T) TR.HA 10	3645	148	174	35000	6250	B9.75/20	DB9.75/20	Her YXC3	6-4 3/4 x 4 3/4	Fu VUOG	U 5	No Tim	BF	R 7.8 55.1	7x3x3 1/4	C
5 (T) TRDA 10	3895	148	174	39000	6450	B9.75/20	DB9.75/20	Her YXC3	6-4 3/4 x 4 3/4	Fu VUOG	U 5	No Own	2F	R 7.5 58.8	8 1/8 x 3x 1/8	C
6 Sterling FB40 1 1/2-2	1135	142	162	10000	3450	B6.50/20	DB6.50/20	Con 25A	6-3 3/4 x 4	Wa T9	U 5	No Own	BF	H 5.66 36.2	6x2 1/2 x 3 1/2	C
7 FB50 2 1/2-3	1240	142	162	11000	3650	B7.00/20	DB7.00/20	Con 25A	6-3 3/4 x 4	Wa T9	U 5	No Own	BF	H 5.66 36.2	6x2 1/2 x 3 1/2	C
8 FB60 2 1/2-3	1590	142	162	12000	4150	B7.00/20	DB7.00/20	Wau TL	6-3 3/4 x 4 1/2	Wa T9	U 5	No Own	BF	H 5.83 37.3	6x2 1/2 x 3 1/2	C
9 FB70 2 1/2-3	2635	174	204	13000	5755	B7.50/20	DB7.50/20	Wau 6ML	6-4 x 4 1/2	Own UC7	U 5	No Own	BF	R 7.5 52.7	10x3 1/2 x 3 1/2	C
10 FD80 3-4	3065	174	204	16000	6680	B8.25/20	DB8.25/20	Wau 6ML	6-4 x 4 1/2	Own UC7	U 5	No Own	2F	R 7.8 55.3	10x3 1/2 x 3 1/2	C
11 FB80 Spec 3 1/2-4	3010	174	204	16000	6680	B8.25/20	DB8.25/20	Wau 6MK	6-4 3/4 x 4 1/2	Own UC7	U 5	No Own	BF	R 8.5 55.6	10x3 1/2 x 3 1/2	C
12 FC90 4	4105	174	204	18000	7480	B9.00/20	DB9.00/20	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	CD	R 8.66 61.1	10x3 1/2 x 3 1/2	L
13 FD90 4	3315	174	204	18000	7480	B9.00/20	DB9.00/20	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	2F	R 10.0 66.6	10x3 1/2 x 3 1/2	L
14 FW97S PD9795 4-5	4355	192	222	19500	8000	B7.00/20	DB7.00/20	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	w/2F	R 7.75 51.6	2x3x2 1/2 x 3 1/2	P
15 FC100 5 1/2-6	4145	192	222	20000	7750	B7.00/20	DB7.00/20	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	CD	R 9.3 61.9	2x3x2 1/2 x 3 1/2	P
16 FC105 5 1/2-6	4645	192	222	21000	8000	B9.00/20	DB9.00/20	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	CD	R 8.66 61.1	2x3x2 1/2 x 3 1/2	P
17 FW115 FD115 5 1/2-6	4690	192	222	23000	8750	B40x8	DP40x8	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	w/2F	R 8.20 54.6	2x3x2 1/2 x 3 1/2	P
18 FC117 5 1/2-6	4700	192	222	21500	8200	B36x8	DP36x8	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	CD	R 8.66 61.7	2x3x2 1/2 x 3 1/2	P
19 FC120S 7 1/2-8	4900	192	222	24000	8400	B9.75/20	DB9.75/20	Wau 6SLR	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	2F	R 8.88 55.8	15x3 1/2 x 3 1/2	P
20 FW140 FD140 7 1/2-8	6005	192	222	28000	10050	B40x8	DP40x8	Wau SRL	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	CD	R 9.3 62.2	15x3 1/2 x 3 1/2	P
21 FC135 7 1/2-8	4800	192	222	27000	8900	B40x8	DP40x8	Wau SRL	6-4 3/4 x 5 1/2	Own UC7	U 5	No Own	CD	R 8.3 55.2	15x3 1/2 x 3 1/2	T
22 FC140 8 1/2-9	5595	200	230	28000	9350	B40x8	DP40x8	Wau AB	6-4 1/2 x 5 1/2	Own UC8	U 5	No Own	CD	R 9.4 58.9	15x3 1/2 x 3 1/2	T
23 FC145 8 1/2-9	6180	200	230	29000	10100	B40x8	DP40x8	Wau AB	6-4 1/2 x 5 1/2	Own UC8	U 5	No Own	w/2F	R 10.0 62.7	15x3 1/2 x 3 1/2	T
24 FW170 FD170 9 1/2-10	6980	200	230	34000	10550	B40x8	DP40x8	Wau AB	6-4 1/2 x 5 1/2	Own UC8	U 5	No Own	CD	R 9.4 58.9	15x3 1/2 x 3 1/2	T
25 FC170 9 1/2-10	6900	200	230	34000	10550	B40x8	DP40x8	Wau AB	6-5 1/2	Own UC8	U 5	No Own	2F	R 7.3 147	9x2 3/4 x 3 1/2	T
26 FD195 12 1/2-13	8925	200	230	39000	10750	B10.50/20	DB10.50/20	Cum H Die.	6-4 7/8 x 5 1/2	BL 734	U 5	No Own	BL 734	R 8.88 55.8	15x3 1/2 x 3 1/2	T
27 Stewart 41X 3/4	695	124	134	2875	8650	B10.50/20	DB10.50/20	Lyc	6-3 1/2 x 4 1/2	VG	U 4	No Cla	S 1/2	H 5.4 35.1	6x2 1/2 x 3 1/2	T
28 42X 1 1/2	795	134	176	3525	8650	B10.50/20	DB10.50/20	Lyc	6-3 1/2 x 4 1/2	VG	U 4	No Cla	SF	H 5.6 35.8	7 1/2 x 2 3/4 x 3 1/2	T
29 43X 2	995	145	176	4005	8650	B10.50/20	DB10.50/20	Lyc	6-3 1/2 x 4 1/2	VG	U 4	No Cla	SF	H 6.3 22.1	7 1/2 x 2 3/4 x 3 1/2	T
30 29XS 2	1695	145	190	4990	8650	B7.00/20	DB7.00/20	Lyc	6-3 1/2 x 4 1/2	Ful	U 4	No Cla	SF	R 6.37 44.4	7 1/2 x 2 3/4 x 3 1/2	T
31 32X 2 1/2	1990	165	220	5260	8750	B7.00/20	DB7.00/20	Lyc	6-3 1/2 x 4 1/2	Ful	U 4	No Cla	SF	R 6.37 44.4	7 1/2 x 2 3/4 x 3 1/2	T
32 58-5 2 1/2	2390	170	226	5970	8750	B7.50/20	DB7.50/20	Lyc	6-3 1/2 x 4 1/2	Ful	U 4	No Cla	SF	R 7.25 47.0	9x2 3/4 x 3 1/2	T
33 18X 3	2690	165	220	6400	8750	B7.50/20	DB7.50/20	Lyc	6-3 1/2 x 5	Ful	U 4	No Tim	WF	R 7.25 47.5	9x2 3/4 x 3 1/2	T
34 48-3	2990	170	211	6750	8825	B8.25/20	DB8.25/20	Lyc	6-3 1/2 x 5	BL	U 4	No Cla	WF	R 7.12 50.1	9x2 3/4 x 3 1/2	T
35 19X 3 1/2	3690	165	235	7110	8900	B9.00/20	DB9.00/20	Lyc	6-3 1/2 x 5	BL	U 4	A 3 Tim	WF	R 7.23 127	9x2 3/4 x 3 1/2	T
36 38-6 3 1/2	3990	170	241	7600	8900	B9.00/20	DB9.00/20	Lyc	6-3 1/2 x 5	BL	U 4	A 3 Tim	WF	R 7.3 147	9x2 3/4 x 3 1/2	T
37 38-8 3 1/2	3990	170	241	7600	8900	B9.00/20	DB9.00/20	Lyc	6-3 1/2 x 4 1/2	BL	U 4	A 3 Tim	WF	R 7.3 147	9x2 3/4 x 3 1/2	T
38 31X 1/2	5190	165	235	9340	9340	B9.75/18	DB9.75/18	Wau	6-4 1/2 x 4 1/2	BL	U 4	A 3 Tim	WF	R 8.82 15.1	15x1 1/2 x 3 1/2	T
39 27XS 7	6190	165	235	10300	10300	B10.50/24	DB10.50/24	Wau	6-4 1/2 x 5 1/2	BL	U 4	A 3 Tim	WF	R 6.56 93.8	8x2 3/4 x 3 1/2	T
40 Studebaker (11) 8 1/2-2 1/2	670	130	165	9000	3110	B6.00/20	P2326	Own	6-3 1/2 x 4 1/2	War T9	U 4	No Cla	SF	H 5.66 36.2	8x2 3/4 x 3 1/2	T
41 8 1/2-2 1/2	785	130	165	3385	6680	B6.00/20	DB6.00/20	Own	6-3 1/2 x 4 1/2	War T9	U 4	No Cla	SF	H 6.8 43.3	8x2 3/4 x 3 1/2	T
42 8 1/2-2 1/2	945	141	165	12000	3930	B6.50/20	DB6.50/20	Own	6-3 1/2 x 4 1/2	War T9	U 4	A 2 Tim	SF	H 6.8 43.3	8x2 3/4 x 3 1/2	T
43 8 1/2-2 1/2	1350	141	183	16000	4855	B6.50/20	DB6.50/20	Own	6-3 1/2 x 4 1/2	War T9	U 4	A 2 Tim	SF	H 6.8 43.3	8x2 3/4 x 3 1/2	T
44 Walter FN 3 1/2-3	4500	120	144	15000	6590	B9.00/20	DB9.00/20	Own	6-4 1/2 x 4 1/2	6MK	U 5	No Own	WF	R 6.00 60.0	0 12x2 3/4 x 3 1/2	P
45 FM 3 1/2-4	5500	120	144	18000	7500	B9.00/20	DB9.00/20	Own	6-4 1/2 x 5 1/2	6SRK	U 5	No Own	WF	R 8.5 85.0	0 11x2 3/4 x 3 1/2	P
46 FKD 3 1/2-4	6300	120	144	24000	9500	B9.75/24	DB9.75/24	Own	6-4 1/2 x 5 1/2	6GRB	U 5	No Own	WF	R 8.5 85.0	0 13x2 3/4 x 3 1/2	P
47 FCS 5-7	7200	136	160	27000	9500	B9.75/24	DB9.75/24	Own	6-4 1/2 x 5 1/2	6GRB	U 5	No Own	WF	R 8.5 85.0	0 13x2 3/4 x 3 1/2	P
48 FBS 5-7	7200	136	160	27000	9500	B9.75/24	DB9.75/24	Own	6-4 1/2 x 5 1/2	6GRB	U 5	No Own	WF	R 8.5 85.0	0 13x2 3/4 x 3 1/2	P
49 FBRG 5-7	8300	136	160	32000	10500	B10.50/24	DB10.50/24	Own	6-4 1/2 x 5 1/2	6GRB	U 5	No Own	WF	R 8.5 85.0	0 13x2 3/4 x 3 1/2	P
50 White (12) 60K 1 1/2-1 1/2	1850	112	112	3905	3700	B7.00/20	DB7.00/20	Own	6-3 1/2 x 4 1/2	3BC	U 3	No Own	WF	R 5.87 22.2	2x3x3 1/2	C
51 60K 1 1/2-1 1/2	1850	138	157	4210	3700	B7.50/20	DB7.50/20	Own	6-3 1/2 x 4 1/2	5B	U 4	No Own	WF	R 6.33 41.4	7 1/2 x 2 3/4 x 3 1/2	C
52 61 1 1/2-1 1/2	1700	138	157	4420	3700	B7.										

Line Number	ENGINE DETAILS										Governor Make	Fuel Feed	Clutch Type and Make	Radiator Make	Universal Make	Front Axle	Brakes	BODY MOUNTING DATA									
	Piston Displacement	Compression Ratio	Torque lb. ft.	N.A.C.C. Rated H.P.	Max. Brake H.P. at R.P.M. Given	Valve Arrangement	Camshaft Drive	Piston Material	Main Bearings	Number and Diameter							Steering Gear Make	Service	Hand Type, Location	Front	Rear						
14283	4.4	280	93-2200	L	G	A	7-3	15	PC	Zen	M	AL	AL	D.Fu	Yo	Spi	Shu	Ros	L41HV	768	TD	106	Opt	31 1/2	40x2 1/2	50x3	
24283	4.4	280	93-2200	L	G	A	7-3	15	PC	Zen	M	AL	AL	D.Fu	Yo	Spi	Shu	Ros	L41HV	893	TD	106	Opt	31 1/2	40x2 1/2	50x3	
34293	4.9	355	115-2200	L	G	A	7-3	15	PC	Zen	M	AL	AL	D.Fu	Yo	Spi	Own	W51A	847	TD	118	Opt	31 1/2	42x3	60x3 1/2		
44783	4.4	318	51-12200	L	G	A	7-3	15	PC	Zen	M	AL	AL	D.Fu	Yo	Spi	Shu	Ros	L41HV	768	TD	91 1/2	Opt	31 1/2	40x2 1/2	50x3	
54783	4.4	318	51-12200	L	G	A	7-3	15	PC	Zen	M	AL	AL	D.Fu	Yo	Spi	Tim	Ros	L41HV	893	TD	92 1/2	Opt	31 1/2	40x2 1/2	50x3	
62143	5.0	137	28.0	L	G	C	7-2	12	PC	Zen	M	AL	AL	D.Fu	Pe	Spi	Tim	Ros	L41HV	269	PT	96	57	34	38x2 1/2	50x2 1/2	
72143	5.0	137	28.0	L	G	C	7-2	12	PC	Zen	M	AL	AL	D.Fu	Pe	Spi	Tim	Ros	L41HV	269	PT	96	57	34	38x2 1/2	50x2 1/2	
82553	6.0	175	28.0	L	G	C	7-2	12	PC	Zen	M	AL	AL	D.Fu	Pe	Spi	Tim	Ros	L41HV	282	PT	96	57	34	38x2 1/2	50x2 1/2	
93583	4.4	230	38.4	80-2500	L	G	A	7-2	12	PC	Zen	M	DR	DR	D.Own	Yo	Spi	Tim	Ros	L41HV	330	TD	144	91	34	42x3	54x3
103583	4.4	230	38.4	80-2500	L	G	A	7-2	12	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	L41HV	330	TD	144	91	34	42x3	54x3
113583	4.4	230	38.4	80-2500	L	G	A	7-2	12	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	L41HV	392	TD	144	91	34	42x3	54x3
123813	4.4	240	40.8	85-2500	L	G	C	7-2	12	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	666	JX	144	91	34	42x3	54x3
133813	4.4	240	40.8	85-2500	L	G	C	7-2	12	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	397	JX	144	91	34	42x3	54x3
144623	4.5	300	45.0	102-2400	L	G	C	7-3	13	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	664	a	144	91	34	48x3	54x3
153813	4.4	240	40.8	85-2500	L	G	C	7-2	12	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	576	a	172	108	34	48x3	54x3
164113	6.6	250	40.8	91-2400	L	G	A	7-3	13	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	562	a	172	108	34	48x3	54x3
174623	4.5	300	45.9	102-2400	L	G	C	7-3	13	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	664	a	172	108	34	48x3	54x3
184623	4.5	300	45.9	102-2400	L	G	C	7-3	13	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	576	a	172	108	34	48x3	54x3
194623	4.5	300	45.9	102-2400	L	G	C	7-3	13	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	588	a	172	108	34	48x3	54x3
204623	4.5	300	45.9	102-2400	L	G	C	7-3	13	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	658	a	172	108	34	48x3	54x3
214623	4.5	300	45.9	102-2400	L	G	C	7-3	13	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	600	a	172	108	34	48x3	54x3
224893	4.5	295	43.4	90-2000	L	G	C	4-3	11	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	666	a	172	108	34	48x3	54x3
235493	4.5	330	48.6	99-2000	L	G	C	4-3	11	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	676	a	172	108	34	48x3	54x3
245493	4.5	330	48.6	99-2000	L	G	C	4-3	11	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	666	a	172	108	34	48x3	54x3
256773	4.4	440	60.0	125-2000	L	G	A	4-3	11	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	658	a	172	108	34	48x3	54x3
266723	17	420	57.0	125-1800	L	G	C	4-3	11	PC	Zen	M	DR	DR	D.Own	Mo	Spi	Tim	Ros	O21MV	707	a	172	108	34	48x3	54x3
272433	4.8	142	23.4	56-2600	L	G	C	4-2	7	PC	No	P	CL	LN	P.BBL	Mo	Tln	27450TN	Ros	W41A	718	a	172	108	34	48x3	60x4
282443	4.8	142	23.4	56-2600	L	G	C	4-2	7	PC	No	P	CL	LN	P.BBL	Fe	Spi	Tim	Ros	W41A	500	a	172	108	34	48x3	54x3
292443	4.8	142	23.4	56-2600	L	G	C	4-2	7	PC	No	P	CL	LN	P.BBL	Fe	Spi	Tim	Ros	W41A	180	a	172	108	34	48x3	54x3
302443	4.8	142	23.4	56-2600	L	G	C	4-2	7	PC	No	P	CL	LN	P.BBL	Fe	Spi	Tim	Ros	W41A	257	a	172	108	34	48x3	54x3
312993	5.0	193	33.8	85-2750	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	308	a	172	108	34	48x3	54x3
323493	5.0	193	33.8	85-2750	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	348	a	172	108	34	48x3	54x3
333443	4.6	224	36.0	102-2600	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	348	a	172	108	34	48x3	54x3
343203	4.6	224	36.0	102-2600	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	453	a	172	108	34	48x3	54x3
343203	4.6	224	36.0	102-2600	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	453	a	172	108	34	48x3	54x3
353443	4.6	224	36.0	102-2600	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	453	a	172	108	34	48x3	54x3
363443	4.6	224	36.0	102-2600	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	453	a	172	108	34	48x3	54x3
373443	4.6	224	36.0	102-2600	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	453	a	172	108	34	48x3	54x3
385163	4.5	330	51.2	110-2000	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	759	a	172	108	34	48x3	54x3
402303	6.0	154	25.4	75-3200	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	231	a	172	108	34	48x3	54x3
412303	6.0	154	25.4	75-3200	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	234	a	172	108	34	48x3	54x3
422303	6.0	154	25.4	75-3200	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	240	a	172	108	34	48x3	54x3
432303	6.0	154	25.4	75-3200	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	240	a	172	108	34	48x3	54x3
443813	4.5	240	40.0	85-2200	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	450	a	172	108	34	48x3	54x3
454623	4.5	300	46.0	100-1900	L	G	C	4-2	9	PC	FP	Mo	St	AL	D.Fu	Fe	Spi	Tim	Ros	W41A	450	a	172	108	34	48x3	54x3
464623	4.5	300																									

Line Number	MAKE AND MODEL	Wheels Driven—6-Wheelers				GENERAL (See Keynote)				TIRE SIZE		MAJOR UNITS						FRAME	
		Tonnage Rating	Chassis Price	Standard Wheelbase	Max. W. B. Furnished	Gross Vehicle Weight	Chassis Wt. (Stripped)	Front	Rear	ENGINE		TRANSMISSION		REAR AXLE		Gear and Type	Gear Ratios	Side Rail Dimensions	Type
										Make and Model	No. of Cylinders Bore and Stroke	Make and Model	Location and Forward Speeds	Aux. Location and Speeds	Make and Model	In High	In Low		
1	Hendrick's n36D (cone'd.)	4R 5-12	6600	Op Op	32500	11200	B9.00/20	DB9.00/20	Wau 6-125	6-4½ x 5½	Fu VU	U 5	No Own 2513X	2B	A Opt	Opt	8x3x11	P	
2	..... 44D	4R 10	8000	Op Op	40000	13200	B9.75/22	DB9.75/22	Wau 6SRK	6-4½ x 5½	BL 60-7	2F	No Eat 44000	2F	A Opt	Opt	8x3x11	P
3	Hug. 99	4R 10	1030	148	58500	15100	S36x8	S40x16	Wat RB	6-5½ x 3½	BL 70-7	2F	No Eat 44000	2F	A Opt	Opt	8x3x11	P	
4	Ind. 95SBT-15	2C	1675	168 186	20000	5500	P32x6	DP32x6	Bud GF6	6-4½ x 6	BL 714-703	2F	A 3 Wis SD410W	2F	R 10.3	139	9x4½x11	C	
5	95SW 75	4R	1735	168 186	20000	5800	P32x6	DP32x6	Her JXC	6-3½ x 4½	BL 224	2F	No Tim SBT151	SF	T 7.4	45.8	7½x2½x11	TL	
6	17SBT251	2C	3250	188 224	28000	8550	P34x7	DP34x7	Her YXC	6-4½ x 4½	BL 334	2F	No Tim SBT251	BF	R 6.1	37.8	8½x3x11	TL	
7	17SW251	4R	3475	188 224	28000	9000	P34x7	DP34x7	Her YXC	6-4½ x 4½	BL 334	2F	No Tim SW75	WF	T 7.4	45.8	7½x2½x11	TL	
8	106SW-151	4R	2675	188 212	24000	7500	P32x6	DP32x6	Her YXC	6-4½ x 4½	BL 324	2F	No Tim SW251	WF	R 6.4	42.6	8x3x11	C	
9	Ken. 186SDT	2C 10	6430	205 235	38000	10500	B9.00/20	DB9.00/20	Her YXC2	6-4½ x 4½	BL 1554	2F	A 3 Wis Sdt310w	2F	H 7.33	104	9x3x11	C	
10	..... 241SDT	2C 10	6850	205 235	40500	11000	B9.00/20	DB9.00/20	Her RXB	6-4½ x 5½	BL 714	2F	A 3 Wis Sdt310w	2F	H 7.33	85.5	9x3x11	C
11	..... 346L	4R 10	8800	210 240	40500	13000	B9.75/20	DB9.75/20	Has 160	6-4½ x 5½	BL 714	2F	A 3 Wis Sdt310w	2F	H 7.25	84.5	8x3x11	C
12	..... 349C	4R 10	9500	210 240	40500	13000	B9.75/20	DB9.75/20	Bud GF-6	6-4½ x 6	BL 714	2F	A 3 Wis Sdt310w	2F	H 7.25	98.4	8x3x11	C
13	..... 350C	4R 10	10200	210 240	40500	14500	B9.75/20	DB9.75/20	Has 175	6-5x6	BL 714	2F	A 3 Wis Sdt310w	2F	H 7.25	102	8x3x11	C
14	Kleiber. 250	4R 7½	6000	201 210	28000	10050	B9.00/20	DB9.00/20	Con 2015	6-4½ x 4½	BL 714-60	2F	A 7 Tim SW75	WF	R 7.5	17	7x3x11	P	
15	..... 340	4R 10	7000	210 215	34000	11900	B9.75/20	DB9.75/20	Con 21R	6-4½ x 4½	BL 714-60	2F	A 7 Tim SW300	WF	R 9.33	88	6x3x11	P
16	..... 340T	4R 10	8000	215 225	34000	13650	B9.75/20	DB9.75/20	Con 22R	6-4½ x 5½	BL 714-60	2F	A 7 Tim SW400W	WF	R 10.398	108	8x3x11	P
17	La Fran-R. Q6	9-12	11605	216 260	40000	14900	B10.50/20	DB10.50/20	Own 312B	12-4½ x 6	BL 714	2F	A 3 Wis SWD410	WF	O 20	100	12x3x11	T	
18	LeMoon(9) 701	4R 3-6	4475	187 199	25500	8500	B8.25/20	DB8.25/20	Lyc AFC	8-3½ x 4½	Fu VUOG	U 5	No Tim SWD410	WF	R 6.20	43	7x3x11	B	
19	..... 801	4R 6-7	5100	187 199	25500	9720	B9.00/20	DB9.00/20	Lyc AFC	8-3½ x 4½	Fu VUOG	U 5	No Tim 6703-97	WF	R 6.75	47.7	7x3x11	B
20	..... 802	4R 6-7	5350	187 199	25500	9800	B9.00/20	DB9.00/20	Wau 6SRL	6-3½ x 5½	Fu VUOG	U 5	No Tim 65703-97	WF	R 6.75	47.7	7x3x11	B
21	..... 900	4R 7-8	6775	191 203	36000	12000	B9.75/20	DB9.75/20	Wau 6SRL	6-4½ x 5½	BL 607	2F	A 7 Tim SW310W	WF	H 9.25	86	9x3x11	B
22	..... 1000	4R 8-10	7950	196 205	40000	12600	B9.75/24	DB9.75/24	Wat 6AB	6-4½ x 5½	BL 714	2F	A 3 Tim SW310W	WF	H 9.25	128	9x3x11	B
23	..... 1200	4R 10-12	8500	196 205	40000	14000	B9.75/24	DB9.75/24	Wat 6RB	6-5x6	BL 714	2F	A 3 Tim SW410W	WF	H 9.25	128	9x3x11	B
24	..... 1200D	10-12	9750	196 205	40000	14000	B9.75/24	DB9.75/24	Cum. Die H6	6-4½ x 6	BL 735	2F	A 5 Tim SW410W	WF	H 7.6	47.6	9x3x11	P
25	Maccar. SW86	4R 10-12	9000	216 260	38700	12850	B10.50/20	DB10.50/20	Her RXCP	6-4½ x 5½	BL 615	2F	A 5 Tim spec.	WF	R 9.0	59	12x3x11	T	
26	Mack. BX	4R 10-12	8150	173 207	35400	12000	B8.25/22	DB8.25/22	Own BX	6-4½ x 5½	Own BX	2F	A 6 53.46	40	O 10.33	x11	C		
27	..... BQ	4R 10-12	9350	224 245	41500	15000	B9.75/22	DB9.75/22	Own BQ	6-4½ x 5½	Own BQ	2F	R 6.54	41.9	10.33	x11	C	
28	..... AC	4R 8-15	8500	217 257	50500	14550	P40x8	DP32x6	Own BQ	6-4½ x 5½	Own AC	2F	R 6.26	59.4	8x3x11	C		
29	..... AK	4R 8-15	9000	217 257	50500	15900	B9.75/22	DB9.75/22	Own BQ	6-4½ x 5½	Own AC	2F	A 7 46.47	8	8½x3x11	C		
30	..... AP	4R 8-15	10500	217 257	51000	14850	P40x8	DP40x8	Own AP	6-5x6	Own AC	2F	A 7 46.47	8	8½x3x11	C		
31	..... AP	4R 8-15	11000	217 257	50500	16400	B9.75/22	DB9.75/22	Own AP	6-5x6	Own AC	2F	A 7 46.47	8	8½x3x11	C		
32	..... Mar-Herr. TH310A-6	7½-10	10000	191 229	34070	13800	B9.75/22	DB9.75/22	Her RXC	6-4½ x 5½	Fu VUOG	U 5	No Tim SWB151	WF	R 9.1164	8½x3x11	P	
33	..... TH320-6	10-12	15000	225 255	43075	18900	B10.50/22	DB10.50/22	Her HXB	6-5x6	BL 724	U 4 A 3 Wis SD420A	2F	R 9.11180	10½x3x11	P		
34	..... TH330-6	12-15	17500	225 255	50130	20100	B11.25/24	DB11.25/24	Her HXD	6-5½ x 6	BL 734	U 4 A 3 Wis SD510	2F	R 10.12180	10½x3x11	P		
35	Mor'd. RA-15	4	15500	170 Op	5300	6.50/20	Her JXC	6-3½ x 4½	BL 224	U 4 Tim SWB151	WF	R 5.66	35.0	7½x3x11	T				
36	RA20 2C 5-5½	1955	184 Op	20000	6350	P32x6	DP32x6	Her JXC	6-3½ x 4½	BL 224	U 4 Tim SWB151	WF	R 6.16	38.2	9½x3x11	P			
37	..... 34K61184	4R	6600	200 240	34000	13200	B9.75/20	DB9.75/20	Her RXB	6-4½ x 5½	Co TNU	U 4 Tim SW310	WF	A 9.25	49.0	10x3x11	C	
38	..... FDT200	2R 8½	7200	180 240	34000	14200	B9.75/20	DB9.75/20	Her GX4	6-4½ x 5½	Co TNU	U 4 Tim SW310	WF	A 7.75	40.6	10x3x11	C	
39	..... 44K77984	4R	7500	180 200	44000	14500	B10.50/20	DB10.50/20	Her HXA	6-5½ x 6	Own 618290	U 4 Tim SW410	WF	A 9.47	210x3x11	L		
40	Relay. 60SW 2R 10	6545	175 205	36500	12000	P38x7	DP40x8	Bud BA6	6-4½ x 5½	Fu VU16	U 5 Own 60	2R	R 9.063.6	8½x3x11	P				
41	..... 44K77984	4R	7500	180 200	44000	14500	B10.50/20	DB10.50/20	Her HXA	6-4½ x 5½	Own UC7	U 5 Own 60	2R	R 7.8	55.5	10x3x11	L	
42	Relay. 60SW 2R 10	6545	175 205	36500	14700	P38x7	DP40x8	Bud BA6	6-4½ x 5½	Own UC7	U 5 Own 60	2R	R 7.8	55.5	10x3x11	L			
43	StirlingFBT152	2R 8½	4550	174 204	30400	9500	B9.00/20	DB9.00/20	Wat 6-110	6-4x4½	Wat 6-110	U 5 Own 60	2R	R 7.8	55.5	10x3x11	L		
44	..... FDT152	2R 8½	4705	174 204	30400	9700	B9.00/20	DB9.00/20	Wat 6-110	6-4x4½	Wat 6-110	U 5 Own 60	2R	R 52.7	10x3x11	L		
45	..... FDS180	4R 8-10	8925	158 Op	36000	12850	P40x8	DP40x8	Wat AB	6-4½ x 5½	Wat AB	U 4 A 3 Tim 310	2F	R 9.1113	15x3x11	L		
46	..... FDS200	4R 10-12	9510	159 Op	40000	13550	P40x8	DP40x8	Wat AB	6-5x5½	Wat AB	U 4 A 3 Tim 410	2F	R 9.1113	15x3x11	L		
47	..... FCS210	4R 15-18	10825	Op Op	42000	14750	P40x8	DP40x8	Wat AB	6-5x5½	Wat AB	U 4 A 3 Tim 410	2F	R 9.559.6	15x3x11	L		
48	..... FDT200	2R 12-12½	7670	178 208	40000	12050	P40x8	DP40x8	Wat AB	6-125	Wat AB	U 4 A 3 Tim 410	2F	R 8.8558.8	12x3x11	L		
49	..... FDT250	2R 16-16½	8855	186 216	50000	13550	P42x9	DP42x9	Wat AB	6-5½ x 5½	Wat AB	U 4 A 3 Tim 410	2F	R 8.8555.5	12x3x11	L		
50	..... FCT180	2R 10-10½	7265	178 208	36000	11200	P36x8	DP36x8	Wat SRL	6-4½ x 5½	Wat SRL	U 4 A 3 Tim 410	2F	R 8.254.5	12x			

Line Number	ENGINE DETAILS										FUEL SYST.	ELEC-TRICAL	FRONT AXLE	BRAKES			BODY MOUNTING DATA	SPRINGS								
	Piston Displacement	Compression Ratio	Max. Brake H.P. at R.P.M. Given	N.A.C.C. Rated H.P.	Valve Arrangement	Camshaft Drive	Piston Material	Main Bearings	Number and Diameter	Length				Carburetors Make	Fuel Feed	Ignition System Make	Generator, Starter Make	Clutch Type and Make	Radiator Make	Universals Make	Make and Model	Steering Gear Make	Service	Hand Type, Location	Cab to Rear of Frame	Cab to Rear Axle	Width of Frame	Front	Rear	Auxiliary Type
1462 4.6 324 45.9 125-2600 F G C 7-3 13 1/2 PC Wa Zen M AL AL D Fu Ch Blo Tim 27450 Ros L41HV 504G TD Opt Opt 34 40 1/4 x 3 1/2 35 1/4 x 4																										
2517 4.6 330 51.2 110-2000 F G C 7-3 13 1/2 PC Wa Zen M AL AL D BL Ch Blo Tim 27450 Ros Ws41A 780G TX Opt Opt 36 40 1/4 x 3 1/2 66x4																										
3677 4.7 440 60.0 126-1850 L G C 4-3 1/2 10 1/2 PC Wa Zen M AL AL D BL Ch Blo Tim 27450 Ros Ws41A 780G TX Opt Opt 36 43x3 1/2 66x4																										
4638 4.3 410 54.1 126-1850 L G C 4-3 10 1/2 PC Pe Zen M RB No dp BL Yo Blo Shu 715-11 Ros Ws41A 792G TD 139 88 1/2 38 1/2 41 1/2 x 6 53x4																										
5282 5.3 186 33.7 73-2800 L G A 7-2 1/2 10 1/2 PC No Str M AL AL P BL Yo Spi Tim 31020 Ros L61HV 559G TX 140 83 34 37x2 1/4 52x4																										
6282 5.3 186 33.7 73-2800 L G A 7-2 1/2 10 1/2 PC No Str M AL AL P BL Yo Spi Tim 31020 Ros L61HV 459G TX 140 83 34 37x2 1/4 44x3																										
7428 4.4 283 45.9 94-2200 L G A 7-3 14 PC Ha Str M AL AL P BL Yo Spi Shu 5582B Ros L61HV 625G CD 168 101 34 40x2 1/2 52x4																										
8428 4.4 283 45.9 94-2200 L G A 7-3 14 PC Ha Str M AL AL P BL Yo Spi Shu 5582B Ros L61HV 625G CD 168 101 34 40x2 1/2 52x4																										
9339 4.7 216 33.4 76-2400 L G A 7-2 1/2 23/4 PC Ha Str M AL AL P BL Yo Spi Shu 5572 Ros L61HV 559G CD 168 101 34 37x2 1/4 52x4																										
10453 4.7 300 48.6 98-2200 L G A 7-3 14 CC Ha Zen M DR DR P BL Pe Spi Tim 35000N Ros Ws4rA 815G FD 192 120 33 3/4 42x3 56x4																										
11501 4.9 330 48.6 110-2200 L G A 4-2 1/2 10 1/2 PC FP No Zen M DR DR P BL Pe Spi Tim 36020N Ros Ws4rA 815G FD 192 120 33 3/4 42x3 56x4																										
12498 4.4 322 43.3 125-2400 IL C A 4-2 1/2 10 1/2 PC FP No Zen M DR DR P BL Pe Spi Tim 36020N Ros Ws4rA 815G FD 192 120 33 3/4 42x3 56x4																										
13638 4.3 410 54.1 126-1850 L G C 4-3 10 1/2 CC Ha Zen M DR DR P BL Pe Spi Tim 36020N Ros Ws4rA 815G FD 192 120 33 3/4 42x3 56x4																										
14707 4.4 506 60.0 1170-2000 B G A 7-3 14 FP HS Zen M DR DR P BL Pe Spi Tim 36020N Ros Ws4rA 815G FD 192 120 33 3/4 42x3 56x4																										
15707 4.4 506 60.0 1170-2000 B G A 7-3 14 FP HS Zen M DR DR P BL Pe Spi Tim 36020N Ros Ws4rA 815G FD 192 120 33 3/4 42x3 56x4																										
16411 4.2 2236 40.0 89-2400 B G C 7-2 1/2 13 FP No St V R B DR D BL Ow Spi Tim 16302 Ros T41A 848G G TD 180 120 38 44x3 60x4																										
17427 4.2 2267 45.9 100-2600 B G C 7-2 1/2 13 FP No St V R B DR D BL Ow Spi Tim 16302 Ros T41A 848G G TD 180 130 38 44x3 60x4																										
18638 4.2 2340 54.0 120-2400 B G C 7-2 1/2 13 FP No St V R B DR D BL Ow Spi Tim 17300 Ros T41A 848G G TD 204 130 38 44x3 60x4																										
19754 5.1 510 76.7 1240-2900 H G C 4-3 1/2 10 PC No Zen M DR DR dp Lo Ow Spi Tim 27450TW Ros Ws61A 782D a																										
20420 5.2 300 44.4 130-2800 L G G 5-2 1/2 12 3/4 FP Ha Str M DR DR D Fu Ch Spi Tim 35000H Ros L61HV 525G CD 111 216 34 44x3 None																										
21420 5.2 300 44.4 130-2800 L G G 5-2 1/2 12 3/4 FP Ha Str M DR DR D Fu Ch Spi Tim 35000H Ros L61HV 633G CD 162 108 34 39x2 1/2 46x3 1/2																										
22462 4.5 300 45.9 98-2000 L L G G 5-2 1/2 12 3/4 PC Wa Str M AL DR D BL Ch Spi Tim 30000TW Ros Ws61A 782D a																										
23402 4.5 300 45.9 98-2000 L L G G 5-2 1/2 12 3/4 PC Wa Str M AL DR D BL Ch Spi Tim 30000TW Ros Ws61A 966G CD 162 108 34 48x3 1/2 53x4																										
24549 4.5 5332 48.6 100-2000 L L G G 5-2 1/2 12 3/4 PC Wa Str M AL DR D BL Ch Spi Tim 27450TW Ros Ws61A 966G CD 162 108 34 48x3 1/2 53x4																										
25677 4.6 460 60.0 1170-2000 L L G G 5-2 1/2 12 3/4 PC Wa Str M AL DR D BL Ch Spi Tim 27450TW Ros Ws61A 966G CD 162 108 34 48x3 1/2 53x4																										
26672 4.6 420 57.1 125-1800 H G S 7-3 14 FP OW No P N G LN dp BL Ch Spi Tim 27450TW Ros Ws61A 1151G CD 162 108 34 48x3 1/2 53x4																										
27529 4.9 350 51.2 112-2000 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D BL Pe Spi Tim 26450TW Ros Ws61A 1151G TD 98 116 33 42x3 None																										
28468 4.7 398 52.4 104-2300 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D BL Pe Spi Tim 26450TW Ros Ws61A 1118G TD 109 33 1/4 54x3 1/2 48x3 1/2																										
29708 4.5 398 52.4 128-2200 L L G G 5-2 1/2 12 3/4 PS Ow Str M RB NE P Ow Ow Spi Cle Own BX Ros O61A 902F FD 102 111 33 1/4 50x3 1/2 52x4																										
30611 5.0 398 52.4 128-2200 L L G G 5-2 1/2 12 3/4 PS Ow Str M RB NE P Ow Ow Spi Cle Own BK Ros O61A 902F FD 102 111 33 1/4 50x3 1/2 52x4																										
31311 5.0 398 52.4 128-2200 L L G G 5-2 1/2 12 3/4 PS Ow Str M RB NE P Ow Ow Spi Cle Own AC Ros O61A 1052F FD 180 109 37 48x3 1/2 52x4																										
32706 4.8 424 52.4 104-2300 L L G G 5-2 1/2 12 3/4 PS Ow Str M RB NE P Ow Ow Spi Cle Own AK Ros O61A 1044F FD 180 109 37 48x3 1/2 52x4																										
33709 4.8 427 60.0 138-1900 L L G G 5-2 1/2 12 3/4 PS Ow Str M RB NE P Ow Ow Spi Cle Own AK Ros O61A 1052F FD 180 109 37 48x3 1/2 52x4																										
34529 4.8 350 51.3 115-2200 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D Fu Ch Spi Tim 27450TW Ros Ws61A 1092F FD 109 37 48x3 1/2 52x4																										
35707 5.6 455 60.0 150-2000 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D Fu Ch Spi Tim 27450TW Ros Ws61A 1092F FD 109 37 48x3 1/2 52x4																										
36855 5.2 550 72.0 180-2000 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D Fu Ch Spi Tim 27450TW Ros Ws61A 1092F FD 109 37 48x3 1/2 52x4																										
37282 5.0 176 33.8 73-2800 L L G G 5-2 1/2 12 3/4 PC No Zen M AL AL P BL Lo Spi Tim 30000H Ros L61HV 412G TD 156 90 34 40x2 1/2 44x3																										
38282 5.0 176 33.8 73-2800 L L G G 5-2 1/2 12 3/4 PC No Zen M AL AL P BL Lo Spi Tim 31000H Ros L61HV 570G TD 168 102 34 40x2 1/2 52x4																										
39501 4.6 330 48.6 110-2200 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D BL Ch Spi Tim 27050 Ros T61A 940D CD 186 1/4 118 1/4 34 41x3 56x4																										
40611 4.5 5410 54.1 130-2000 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D BL Ch Spi Tim 27050 Ros T61A 940D CD 180 1/2 112 1/2 34 41x3 56x4																										
41779 4.5 510 66.1 1 0-1800 L L G G 5-2 1/2 12 3/4 PC Ha Zen M DR DR D BL Ch Spi Tim 27050 Ros T61A 940D CD 180 1/2 112 1/2 34 41x3 56x4																										
42411 4.5 270 40.8 83-2100 L L G G 5-2 1/2 12 3/4 PC Bu Zen V AL AL D Fu Ch Spi Tim 35000H Ros L41HV 744P FD 126 1/2 34 42x2 1/2 58x3																										
43358 5.0 254 38.5 5110-2800 F G C 7-2 1/2 12 3/4 PC Ha Zen M DR DR D Fu Ch Spi Tim 35000N Ros L41HV 596G CX 192 91 34 42x2 1/2 57x4																										
44358 5.0 254 38.5 5110-2800 F G C 7-2 1/2 12 3/4 CC Ha Zen M DR DR D Fu Ch Spi Tim 35000N Ros L41HV 596G CX 192 91 34 42x2 1/2 57x4																										
45549 4.5 330 48.6 99-2000 L L G G 5-2 1/2 12 3/4 CC Ha Zen M DR DR D Fu Ch Spi Tim 26450N Ros Ws41A 576G CX Opt 88 34 48x3 58x4																										
46677 4.4 4440 60.0 125-2000 L L G G 5-2 1/2 12 3/4 CC Ha Zen M DR DR D Fu Ch Spi Tim 27450N Ros Ws41A 792G CX Opt 89 34 48x3 58x4																										
47677 4.4 4440 60.0 125-2000 L L G G 5-2 1/2 12 3/4 CC Ha Zen M DR DR D Fu Ch Spi Tim 27450N Ros Ws41A 792G CD Opt 84 48x3 60x3 1/2																										
48462 5.5 324 45.9 125-2400 F G A 7-3 13 1/2 D—Multiple disk. Dp—Double plate. Q—Plate in oil. P—Single plate																										
49677 4.4 4440 60.0 125-2000 L L G G 5-2 1/2 12 3/4 FP Bu Zen V AL AL D Fu Ch Spi Tim 27450N Ros O41A 792G CX 192 93 34 48x3 10)																										
50462 5.5 300 45.9 102-2400 L L G G 5-2 1/2 12 3/4 FP Bu Zen V AL AL D Fu Ch Spi Tim 27450N Ros O41A 1152G JX 192 94 34 48x3 10)																										
51462 5.0 320 45.9 125-2400 F G A 7-3 13 1/2 CC Ha Zen M DR DR D Fu Ch Spi Tim 27450N Ros O41A 1152G JX 192 94 34 48x3 10)																										
52396 4.9 9250 38.4 100-2100 H G S 7-2 1/2 13 1/2 FP Ow Zen M DR DR P Ow Ow Spi Tim 26450N Ros Own 6D 514G CI 194% 109% 34 1/2 42x3 51 1/4 x 4																										
53519 4.9 332 45.9 118-2100 H G S 7-2 1/2 13 1/2 FP Ow Zen M DR DR P Ow Ow Spi Tim 26450N Ros Own 12D Ros Ws61A 833a CI 194% 109% 34 1/2 42x3 42x4																										
54519 4.9 332 45.9 118-2100 H G S 7-2 1/2 13 1/2 FP Ow Zen M DR DR P Ow Ow Spi Tim 26450N Ros Own 12D Ros Ws61A 833a CI 194% 109% 34 1/2 42x3 42x4																										

KEY TO ABBREVIATIONS AND REFERENCE MARKS

MAKES—ALL—Continued

Wa—Waukesha (governor).
Wau—Waukesha.
W or Wis—Wisconsin.
Wo—Wohrb.
Ws—Westinghouse.
Yo—Young.
Zen—Zenith.

BRAKES—SERVICE

Location

2—Two Wheels, rear only.
2/4—Two-wheel brakes effective on all four wheels through driveshaft.
T/4—Brake on transmission effective on all four wheels through driveshaft.
4—Four Wheels, front and rear.
4r—Four Wheels, rear only.
6—Six Wheels, front and rear.
J—Jackshaft.
P—Propeller shaft.

Type

I—Internal.
X—External.

Operation

A—Air.
D—Hydraulic and mechanical.
H—Hydraulic.
M—Mechanical.
V—Vacuum.

BRAKES—HAND

Location

C—Center of double propeller shaft.
2—Rear wheels.
4—Four wheels.
R—Worm or bevel gearshaft.
T—Transmission.
F—Driveshaft.

Type

D—Tru-Stop disk.
I—Internal.
X—External.

Brake Drums

Material

a—Cast alloy iron.
A—American Car Fdry.
D—Dayton.
E—Ermalite.
G—Gunite.
H—Hunt Spiller.
c—Cast iron.
f—Forged steel.
p—Pressed steel.
s—Cast steel.

(Where a combination of any of the above is used, the first reference mark applies to the front and the second to the rear drums.)

Clutch

Type

D—Multiple disk.
dp—Double plate.
Q—Plate in oil.
P—Single plate

Engine

Valve Arrangement

F—Inlet valve in head; exhaust valve at side.

H—In head.

L—“L” head.

C—Chain.

G—Gear.

S—Semi-steel.

C—Cast iron.

N—Nickel iron.

S—Aluminum alloy with strut.

Main Bearings

r—Rear main bearing.

B—Ball bearing.

M—Mechanical pump.

P—Pressure.

V—Vacuum.

E—Electric pump.

G—Gravity.

M—Mechanical pump.

P—Pressure.

V—Vacuum.

F—Full-floating.

H—Hypoid.

I—Internal Gear.

2—Double Reduction.

R—Relay Pendulum Drive.

S—Spiral bevel.

W—Worm.

w/2—Worm or Double Reduction.

Optional.

Oiling System

Material

CC—Pressure to main, connecting rod and camshaft bearings.

FP—Pressure to main, connecting rod, camshaft bearings and piston pins.

PC—Pressure to mains and connecting rod bearings.

PQ—Pump, gravity and splash.

PS—Pressure with splash.

SP—Circulating with splash.

Frame

Type

I—I Beam.

Ch—Channel.

T—Channel tapered front and rear.

L—Channel reinforced with liner.

B—Channel reinforced with both liner and fishplate.

P—Channel reinforced with plate.

TL—Channel tapered front and rear reinforced with liner.

D—Drop Center.

T—Tapered front.

Fuel System

Fuel Feed

E—Electric pump.

G—Gravity.

M—Mechanical pump.

P—Pressure.

V—Vacuum.

REAR AXLE

Final Drive and Type

B—Bevel.

C—Chain.

Coordination of Transport Services As It Stands Today

CONTINUED FROM PAGE 13

tal stock of which is owned entirely by railroad companies of the U.S.

Coordinated motor-rail freight transportation services divide into two principal classes: all coordinated line-haul services, and coordinated terminal services.

A number of railroads have established coordinated motor and railroad freight transportation in their line-haul services in order to improve the speed of transportation, to reduce the cost of certain types of transport services, to render more flexible services or to serve territories which cannot be served with railroad facilities.

Motor truck services are used by a number of railroad lines to improve the operation of local way-freight trains. These trains were once stopped at each local station along the divisions over which they operated in order to deliver and pick-up a small number of consignments of less-than-carload freight at each local station. One of the most important examples of this type of coordinated motor-rail-line-haul transportation is the use of motor truck service to supplement way-freight train service by the Pennsylvania. On one division of that road, way-freight trains are stopped at zone-stations only where all outbound shipments and inbound shipments from or to other stations in each zone are picked up or delivered by the way-freight trains, and the shipments are transported to or from the other stations in the respective zones by motor trucks operated by motor haulage companies acting as agent of the railroad company. This plan of operation has improved the railroad freight service materially by eliminating the interference of the way trains, which formerly made stops at stations every mile or so along the line, with passenger and freight trains that now make only a few stops at the zone stations, thereby reducing the running time of such trains to a fraction of the former operating schedule.

Another important type of coordinated line-haul motor-rail freight service is the "Blue Streak" freight service offered by the St. Louis-Southern Railway Lines, usually known as the Cotton-Belt System, between St. Louis, Missouri, and points in the Southwest. Specially inspected railroad freight cars and fast passenger locomotives are used on the "Blue Streak." The train is scheduled to leave St. Louis at 5:30 P.M. each day and to arrive at Shreveport, La., the next morning at 11:50 A.M. The distance between these cities is 592 miles. Stops are made at intermediate points, such as Jonesboro, Stuttgart, Pine Bluff, Little Rock, and Camden, Arkansas; and at Texarkana, Texas, where motor trucks complete this high-speed transportation service.

The "Ferry Truck" service of the

Chicago, North Shore and Milwaukee Railroad is another interesting and important type of coordinated railroad and motor freight service. This railroad owns trailers which are placed by tractors at the warehouses of shippers to be loaded with less-than-carload freight shipments. When loaded, the trailers are conveyed by tractors to the railroad stations, where the vehicles are run on their own wheels aboard railroad flat cars, which are equipped with clamps to hold the trailers in place during the railroad journey. At destination, the trailers are run off the railroad flat cars and conveyed to the warehouses of consignees by tractors.

Somewhat similar to the "ferry-truck" service, is the service offered by several eastern railroads, including the Pennsylvania Railroad, collectively known as "Truck-Body" services. Under this arrangement, demountable truck bodies are loaded at the warehouses of shippers or at the stations of motor haulage companies with merchandise freight of any kind. After being loaded, the demountable truck bodies are placed upon motor truck chassis and conveyed to railroad stations, where the truck-bodies are lifted by crane conveyors to railroad gondola cars. The bodies are transported by railroad to destination, where they are lifted from the railroad cars and placed upon truck chassis to be hauled to the warehouses of the consignees.

Akin to the "truck-body" and "ferry-truck" "truck" services are the "container-car" services which have been the objects of high hopes and acrimonious discussion for the past ten years. The containers are designed for use as interchangeable equipment between railroads and motor trucks. The freight is loaded into the containers by individual shippers at their places of business or by freight forwarding companies at their concentration stations, to be hauled by motor truck to the railroad freight stations. Here the containers are hoisted by cranes to railroad cars, of the gondola or flat types, especially equipped to receive batteries of containers. At destination, the containers are lifted from cars by cranes or transferred from the railroad cars to motor trucks or station platforms for delivery to the distribution stations of the freight forwarding companies or to the places of business of the consignees. Container car service has been of greatest usefulness to the freight forwarders.

Another type of coordination which is not as a rule considered when plans of railroad and motor freight coordination are discussed, is the coordinated service offered shippers and consignees by the freight forwarding companies. These companies act as intercepting agents who collect small less-than-carload shipments from shippers, truck the shipments to concentration stations connected with railroad lines, load the shipments into classified carload lots or into container lots, for-

ward the shipment by railroad to their destination distribution centers, and distribute the consignments to their intended consignees by local motor trucking or short-haul highway motor freight services.

The coordination of railroad and motor transportation is also found in various parts of the United States where motor vehicles are used to replace railroad services upon branch lines where the volume of traffic is so light as not to justify the costs of operating railroad train services.

Motor vehicles are also used in coordinated line haul service to connect disconnected lines of railroad or to serve "cross-country" routes between railroad lines or divisions, where the distances are unduly long by all-rail routes, or when traffic can be kept out of congested areas by the use of "cross-country" highway routes.

A number of railroads operate, usually through subsidiary motor transportation companies, all-highway transportation services. The vehicles used in these services are often included in the census figures purporting to show the extent of coordination of motor-and-rail transportation facilities. These all-highway services are not coordinated but directly competitive services. They are no more coordinated services than if motor transportation companies bought railroad properties and entered the railroad business.

Now we may turn for even a briefer listing of the ways in which motor vehicles are used in coordinated terminal services. Motor vehicles are used either by railroad, steamship or other line-haul carriers in a great variety of ways to perform various kinds of terminal services. These terminal services may be performed by motor vehicles owned by other types of carriers, by vehicles owned and operated by subsidiary companies, by vehicles owned and operated by agency motor transport carriers, or by motor carriers acting as participating carriers in joint route and rate arrangements.

Types of coordinated rail-and-motor terminal coordinated services include:

First: The use of motor truck service in lieu of lighterage and carfloatage services, as is done by the railroads serving New York, through the use of agency motor haulage companies, where motor trucks are used to transport freight between the railhead stations on the Jersey side of the New York Harbor to "inland" stations on Manhattan Island and Long Island, in place of lighters and carfloats and pier stations.

Second: The extension of railroad services to stations not connected with railroad tracks, through the use of the cartage vehicles of motor transport agents to enable the railroads to serve shippers and consignees located at points not served by the railroads, such as the terminal cartage service between the railroad freight stations at East St. Louis, Ill., and the universal "off-track" stations of the Columbia Motor Terminals Co. at St. Louis, Mo.

Third: The use of motor trucks in railroad trap or ferry car services between railroad stations and industrial plants, to replace railroad freight cars, the carrying capacities of which are unnecessarily large, and to avoid circuitous movements via rail between railroad stations and industrial shippers and consignees.

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Viscosity Change in a Perfect Engine Reflects Oil Quality

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oil was then placed in turn in the engine and used for about 1000 miles, at which point the oil was drained and tested for viscosity and general condition. Oil A, in chart 1, curve 1, was used for reference because it was known to be an oil of very high quality. The first test run checked the mechanical and operating conditions of the engine and the slight increase in viscosity of this oil confirmed the assumption that the oil was of high quality and the engine in excellent mechanical condition.

The second run, using oil B, showed an increase in viscosity from an S.A.E. 30 to almost S.A.E. 40. The oil when drained was much blacker than oil A and was slightly contaminated with sludge and free carbon particles indicating a decomposition of the oil in service. The action of oil B in this test indicates that it contained a higher percentage of light oil and a corresponding higher percentage of heavy oils than oil A because both had same initial viscosity.

Oil C was still worse. At the end of its test run viscosity had increased from S.A.E. 30 to more than 50. When drained, it was badly fouled with sludge and free carbon particles and of a thick, tarry nature. There could be no doubt about the relative lubricating value of oil C as it came out of the crankcase and oil A as it was drained.

At the end of the third test the engine crankcase was thoroughly flushed out with reference oil A, the spark plugs were cleaned and reference oil A was put in for a test run of 1000 miles to check any possible change in the engine. When oil was drained, it was found to have increased its viscosity about the same as in the first test but it was slightly contaminated with sludge which was no doubt carried over from the test run with oil C.

Test run 5 was with oil D which showed greater increase in viscosity than oil B but less than oil C. Oils B and C were then repeated, following which oil B was given a third test and the final test run was with the reference oil A. There is some variation in second test runs with oil, as B and C, but general agreement in result.

When oils of entirely too high viscosity are used in an engine, the change in viscosity of a poor oil is not much different than the change in viscosity of a good oil. This is shown in the tests illustrated on the upper curve in chart 1. Both oils were of approximately S.A.E. 60 viscosity, entirely too high for this engine. Oil A sells for approximately three times as much as oil B. Oil A was used for 4000 miles, being drained and viscosity determined each 1000 miles, and oil C was used for about 5000 miles with draining and testing every 1000 miles. After running the test on

the A oil new piston rings were installed, carbon cleaned and valves ground before the test on oil C.

In both cases there was a slight increase in viscosity, after which there was dilution. There was considerable trouble in maintaining the plugs at full efficiency, no doubt because they were being fouled and subjected to high temperature. The tendency toward crankcase dilution may be accounted for by sticky valves and the sludge trouble. The C oil at draining period had a higher percentage of insoluble sludge and free carbon but otherwise there was very little difference in the action of the two oils. This and other experiments seem to indicate that when oils of excessively high viscosity are incorrectly used in engines, the cost of the respective oil is unimportant so far as lubrication is concerned.

We conducted an experiment which checked both oil and engine and the change in viscosity was found to be entirely in accord with the tests in actual operation reported in this and the preceding article. During the experiment, shown in chart No. 2, we tested viscosity at several points, without draining the oil, in order to get a closer check on viscosity of the oil in the crankcase. At the start of the test the crankcase was filled with an oil equivalent to S.A.E. 40 viscosity which we compounded from a heavy S.A.E. 70 oil and the very light oil recovered from an oil reclaimer, frequently called penetrating oil. A test at the end of 500 miles of operation showed viscosity more than S.A.E. 60, and when the oil was drained at 1000 miles it had become almost equal in viscosity to S.A.E. 70, which was the same as the original oil. During this test run it was necessary to add a few extra quarts of the S.A.E. 70 oil but this did not have any appreciable effect on results. Fresh oil of S.A.E. 70 viscosity was put in the crankcase and an old set of spark plugs were installed and the carburetor was adjusted for a rich mixture. At the end of 500 miles viscosity was down to about 50. At this point the carburetor was cut down a trifle and at the end of 1000 miles test run the viscosity was down to almost 40. It was not necessary to add any more oil during this test run and the oil level was practically the same at the end of the test as at the beginning.

At this point, the start of run three, the carburetor was properly adjusted to its original setting, new spark plugs were installed and an S.A.E. 40 oil was used in the crankcase. During this period there was an increase in viscosity to 45. At the start of run four, the old spark plugs were put back and the carburetor reset for a rich mixture and the crankcase was again filled with new oil of S.A.E. 40 viscosity. At the end of 1000 miles viscosity was down below S.A.E. 30, as shown at the end of run four.

During run five viscosity was tested without drainage at three points. The

run was started with S.A.E. 30 oil in the crankcase and the carburetor adjustments and spark plugs as in test run four. The last oil used was of low quality, judging from the price, and the oil was not changed but new oil was added as needed from time to time. The length of test run five is 4250 miles. The first test of viscosity showed a decided drop, indicating dilution, and from this point on there was a steady increase in viscosity until it reached more than 40 when it was drained out. The change in viscosity in this oil during this run is explained as follows: Gasoline passing by the rings caused dilution and lowering of viscosity for the first 1000 miles. During this time evaporation of the light oil, included in the crankcase oil, was exceeded by the gasoline coming down from the cylinders. The light oil ends continued to evaporate, and as new oil was added the remaining oil in the crankcase became of higher and higher viscosity. A point was reached where normal dilution did not maintain the low viscosity and this was partly due to the fact that the decreased lubrication value of the very heavy oil caused an increase of engine temperature.

Coordination of Transport Services As It Stands Today

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Fourth: The interchange of freight among railroads by motor trucks used in lieu of railroad freight cars, in order to take advantage of the smaller motor vehicular units, to reduce transfer time, and to eliminate round-about railroad terminal interchange movements.

Fifth: The use of motor trucks in place of railroad equipment in distributing shipments from main freight stations to outlying freight stations of the same railroad, and in concentrating shipments delivered at the outlying stations at principal carload freight houses so as to make possible the heavier and motor direct loading of freight cars.

Sixth: Substitution of motor truck for railroad service in connection with movements of freight between points in the same terminal area, so as to keep intra-terminal freight movements out of the congested terminal areas entirely.

Seventh: The connection of railroads and steamship lines by motor trucks in lieu of railroad switching services.

Eighth: The substitution of motor trucks for railroad freight cars and switching service to connect steamship piers with industrial sidings of shippers and consignees.

Ninth: Organized cartage service, including store-door pick-up and delivery services.

Coordination is not a panacea for all ills of transportation, but it is a means of conserving the best interests of carriers and shippers. Progress is being made in coordination, but the ultimate achievement of a comprehensive system of coordination depends upon the more complete understanding of the true costs of transportation of each type of carrier, a fair and equitable system of local, state and federal taxation, and a constructive and comprehensive system of regulation of all types of carriers, so as to give each type of carrier the fullest opportunity to fill the role on the stage of transportation for which it is economically best fitted.